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IN

ARTS, MANUFACTURES,

AND

AGRICULTURE;

BEING A CONTINUATION, ON AN ENLARGED PLAN,

OF THE

Repertory of Arts & Manufactures,

A WORK ORIGINALLY UNDERTAKEN IN THE YEAR 1794, AND STILL CARRIED ON
WITH A VIEW TO COLLECT, RECORD, AND BRING INTO PUBLIC NOTICE,
THE USEFUL INVENTIONS OF ALL NATIONS.

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THE
REPERTORY

OF

PATENT INVENTIONS.



No. XCVII. NEW SERIES. — JANUARY, 1842.

Specification of the Patent granted to THOMAS HARRIS, of Hale's Owen, near Birmingham, Horn Button Manufacturer, for Improvements in the Manufacture of what are called Horn-Buttons, and in Dies to be used in the Manufacture of such description of Buttons. —Sealed April 22, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—

My invention relates, first, to a mode of applying flexible shanks in the manufacture of horn-buttons.

Secondly, my invention relates to a mode of ornamenting horn-buttons, by inlaying the front surface thereof.

Thirdly, my invention relates to a mode of ornamenting what are called horn-buttons, by gilding or silvering their surfaces.

Fourthly, my invention relates to a mode of constructing dies, by applying separate boundary circles to each engraved surface of a die, by which the process of engraving, as well as the forming accurate dies, will be facilitated.

Fifthly, my invention relates to a mode of constructing dies used in the manufacture of horn-buttons, whereby the horn or hoof employed, will not be permitted to be expressed beyond the circumference of the button. And

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in order that my invention may be most fully understood and readily carried into effect, I will explain the means pursued by me in performing my invention.

In the manufacture of what are called horn-buttons, as heretofore and at present generally practised, the material horn or hoof used, is first cut into circular discs called "button blanks," by suitable presses, and such discs or blanks are then stained or dyed, and while soft a metal shank is fixed into the centre of each by work people, who use nippers or pliers to hold the shanks when pressing them into the button blanks. These button blanks, when sufficiently dry, are put into dies consisting of two plates. In the bottom plate are cavities, wherein the shanks of the button blanks are put, the upper plate has recesses either plain or ornamented, according to the class of horn-buttons to be made. The lower die containing the button blanks is then heated by a stove, and the upper plate is also heated and then put on to the lower plate, and the two together, with the button shanks between them, are then pressed to form the buttons, and at the same time to fix the metal shanks, and they remain under pressure till they are cooled, and thus is a series of horn-buttons produced. The buttons thus made have then to have the edges clipped smooth and finished, as is well understood; and it has been proposed to make horn-buttons having flexible shanks, by fixing the flexible shanks at the time of forming the button, in the same manner as metal shanked-buttons have heretofore and now are made, and a patent was taken for such mode of making horn-buttons; but buttons of that description have never come into the market, and I believe the mode could not be practically carried out, owing to the shanks not being well affixed in the buttons, and the great pressure and heat which are necessary to form a button, are prejudicial to the well applying of flexible shanks: and I have found, that although horn-buttons with metal shanks, are readily made at one operation, yet horn-buttons with flexible shanks,

require two processes of pressure in suitable dies, beneficially to manufacture them. The first pressure being applied to the button blanks, when in suitable moulds, subject to the usual high temperature, in order thus to make buttons without shanks. The second pressure being to fix the flexible shanks, and to produce the ornamental front surfaces to the buttons, if they are to be ornamented, which second pressure is performed at much less temperature, and with much less pressure than is necessary, when forming the button and fixing the shank at the same operation.

Description of the Drawing.

Fig. 1, represents a lower die of the ordinary construction, such as is used in producing horn-buttons, with plain smooth front surfaces.

Fig. 2, is an upper die, such as I use in producing the back surfaces of the buttons, and also to form the recesses or grooves for receiving the flexible shank.

Fig. 3, is a button blank of horn or hoof.

Fig. 4, shews the form of button produced by the dies, figs. 1 and 2. The buttons so formed are now ready to receive flexible shanks, and if the buttons are to have plain smooth front surfaces, then in fixing the flexible shanks, the same under die fig. 1, is to be used, but if the front surfaces of the buttons are to be embossed or ornamented, then in place of the die, fig. 1, being used, a similar die having engraved suitable ornamented surfaces is to be used, as the under die, fig. 5, is to be used, and those dies are not to be heated so highly as when forming buttons in the dies, figs. 1 and 2, which are heated as heretofore, when fixing shanks to buttons. The lower or face-die, containing the previously formed buttons, is to be heated till a drop of water will nearly boil, and so that the horn of the buttons is not so hot but that it might be handled, the shanks are then to be introduced and the upper or shank-die applied, but it is not to be heated. The

upper and lower dies together are to be submitted to pressure with the buttons between them, and the upper or shank-die, or plate, will receive sufficient heat from its contact with the lower or face-die: the workman, after a short experience, will readily judge of the heat requisite for this second pressure, he being careful to keep the heat down as much as possible, so as not to injure the fabric of which the shank is composed. It will, therefore, be seen that buttons made by the dies, figs. 1 and 2, are to be placed into proper under dies, engraved or plain, as above explained; then, when the dies and buttons are heated, a metal shell or collet with the flexible shank, *b*, and also the plate of metal, *c*, are to be placed in the groove or recess of each button, *a*; then the upper die, fig. 5, is to be placed on the lower die, and the two altogether submitted to pressure until they are cooled, when the buttons are to be finished as heretofore. By such means of first forming a button without a shank, by pressure in dies, and then by a second pressure in dies to affix a flexible shank thereto, I am enabled advantageously to manufacture horn-buttons, having flexible shanks.

I will now proceed to explain the second part of my invention, which relates to a mode of ornamenting horn-buttons, by inlaying the front surface thereof. This part of my invention is performed in a very similar manner to what has been above described for fixing flexible shanks, and consists, in first forming the front face or surface of a button in suitable dies, producing a recess; then, by a second pressure in dies to affix the ornamental surface, and when desired, also to emboss the surrounding front surface of the button.

Fig. 6, shews parts of the upper die, used in giving the first pressure to the button-blank, to produce the button of the shape desired, with a groove or recess of the proper figure for receiving the intended ornament to be inlayed.

Fig. 7, shews a plan of parts of the lower die, and it

will be seen that one half of the die is suitable for forming horn-buttons, and fixing metal shanks at one operation ; and the other half of this die is suitably formed for producing buttons with grooves or recesses at their back surfaces, in order to their having flexible shanks applied thereto, according to the first part of my invention ; but the dies may be made for producing only one sort of button, and it will be seen that only the two ends of these dies are shewn, they being broken or separated in the middle, to indicate that the dies may be of any length the manufacturer may think desirable.

Fig. 8, shews a longitudinal section of the two dies, figs. 6 and 7, with the horn-buttons within them.

Fig. 9, shews a front view, a section, and a back view of a horn-button, produced by the dies, figs. 6 and 7, which, when completed, will be made according to the first and second parts of my invention ; but if the button is made according to the second part of my invention, only then in place of the button, *a*, having a groove at the back, as shewn, it would have a metal shank.

Fig. 10, shews a metal ornament to be inlaid or fixed on the front surface of the button ; but it should be stated, that the ornamenting surface to be fixed in the front surface of the button, may be of pearl or other material, and of the size and device varied according to taste.

Fig. 11, shews the parts employed for the flexible shanks, and are similar to those before described.

Fig. 12, shews part of the lower die for giving the second pressure for affixing the ornamental surface, and if desired, the remaining front surface of the button may be ornamented by having the die fig. 12 engraved, or otherwise suitably ornamented.

Fig. 13, shews part of the upper die, when flexible shanks are to be fixed at the same time as inlaying the front surface ; but if the buttons have had metal shanks affixed therein in the first pressure, then there is to be a

suitable recess formed in the die for receiving the shank of each button.

Fig. 14, shews a front view, a section, and a back view of a button made according to the first and second parts of my invention : that is, having an ornamental inlaid surface affixed by a second pressure of the button, in dies ; and a flexible shank fixed by a second pressure, as above described.

Fig. 15, shews a section of the parts of dies, figs. 12 and 13, with buttons between them.

In using these dies, a button, *a*, having an ornament placed in the groove or recess, is to be placed in each of the die surfaces of the die, fig. 12, and into the groove at the back of each button, *a*, is to be placed a flexible shank, and then the upper die, fig. 13, is placed on the under one, these dies being moderately heated, as before described when only fixing flexible shanks ; and pressure is to be applied to the dies till they and the buttons are cooled, the effect of which will be that the ornamental surface will be fixed by the compression to the horn or hoof, and thus may various ornamental surfaces be affixed by pressure.

I will now describe the third part of my invention, which relates to a mode of ornamenting what are called horn-buttons, by gilding or silvering their surfaces. In carrying out this part of my invention, I make horn-buttons with such ornamented or plain surfaces as heretofore practised, or according to the means described in this my specification ; and by the aid of a soft brush, I apply a suitable cementing or adhesive material, for causing the gold or silver leaf to attach itself to the surface of a button, or to a part of the surface of a button, according whether it is intended to gild or silver the whole or only a part of the surface of the button ; the cementing or adhesive material which I use, is drying varnish, rendered sufficiently liquid by essence of turpentine, but I do not confine myself thereto, though I believe it best for the

purpose; when the varnish is nearly dry, I apply gold or silver leaf, and press it in the same manner as is practised when gilding and silvering other surfaces; by thus treating horn-buttons, a very novel manufacture of that description of buttons may be produced.

I will now describe the fourth part of my invention, which relates to the construction of dies used in the manufacture of horn-buttons. In making dies for such purposes, it is usual to sink and engrave several surfaces on one plate of metal, for making several buttons by one pair of dies, but it has been found difficult to engrave many patterns, particularly when using engraving-engines or machines, owing to the gravers not being allowed to pass the boundary line of the sunk surface. It has, however, been proposed to form the engraved die for making several buttons of two plates of metal, in which case several surfaces are engraved, each suitable for a button, without respect to the boundary line of the die for each button; and on to the plate of metal so engraved, a second plate has been fixed, having as many circular holes as the other plate has engraved surfaces; by this means, the lower die has been formed; but I believe, such mode has not come into general use, and although such plan of constructing dies, offers advantages in respect to facility for engraving the patterns thereon, yet there is considerable difficulty in so forming the second plate, that all the holes therein will accurately fit to their respective engraved surfaces; and it will readily be understood, that any little inaccuracy in the correctly fitting or centering of any one of the several engraved surfaces on one plate, with respect to its circular boundary produced in the second plate, (which is affixed to the engraved plate,) would be highly prejudicial; for which reason, probably, this mode of forming dies has not been found generally successful. Now, the object of this part of my invention, is to pursue a like means in making the engraved plate, but in place of having several circular boundary lines in

one plate, I apply separate boundary lines to each engraved surface of the plate, whereby the accuracy of fitting will be ensured, as no one of the bounding circles of any engraved surface of a plate depends on another bounding circle; each being separate one from the other, and consequently, each is capable of separate adjustment and fixing, and will in no way interfere with the correctness of the bounding circle of any other engraved surface of the same plate: whereas in the plan before spoken of, many bounding circles being formed in one plate, offered great difficulty to each and every of them being accurately centred in respect to their engraved surfaces.

Fig. 16, shews a plan of part of a die constructed according to this part of my invention. *

Fig. 17, is a section thereof.

Fig. 18, is another plan of the same plate, but shewing it without the boundary circles; and,

Fig. 19, is a section of fig. 18. *f, f*, is the plate which is engraved at the several parts, *g, g, g*; around each of which engraved surfaces, are circular grooves or recesses to receive the bounding circles, *h, h*, which fit accurately. By this means, the graver is not confined to move within the bounding line, as the line is not present when engraving the plate, and the graver may pass beyond, and the grooves and the bounding circles may readily be made with great accuracy to each of the engraved surfaces.

The fifth part of my invention also relates to a mode of constructing dies for the manufacture of horn-buttons. In constructing dies for manufacturing horn-buttons as heretofore practised, it has been usual so to form them, that the horn or hoof used may slightly escape round the edges as is well known, hence the edges of each button has to be clipped, or to have the projecting rough edges removed. Now the object of this part of my invention, is so to form the dies that the bounding circle shall be of such a depth that the counter die may slide within it and

fit accurately, so that the circumference of each button shall be formed smooth and accurate by the interior of the die, in place of permitting the horn or hoof, of which the button is formed, being pressed out beyond the bounding circular line of the die, as heretofore; and I prefer to make single dies, and to arrange them in respect to the counter-dies, in such manner that two dies may be used with each counter-die. These dies being intended to be used in those cases where the horn-button with metal shanks, or buttons to receive flexible shanks, have been first made in other dies.

Fig. 20, shews a section of two dies and one counter-die, according to this part of my invention.

Fig. 21, shews a plan and section of the dies separately; and,

Fig. 22, shews two plans and two sections of a counter-die; one suitable when fixing flexible shanks according to the first part of my invention, and the other for aiding in forming horn-buttons when metal shanks are used. h^1 , h^1 , are the dies having the engraved surfaces, i , i , on separate circular discs of metal, such as have heretofore been used. j , is the counter-die, and, k , a tube within which the counter-die is held; the object of this tube being to guide the projecting edges, l , l , of the dies, as shewn, and thus keeping the dies and counter-die correct to each other.

Fig. 23, shews a section of two dies, h^1 , and counter-die, j ; but in this case, the tube, k , is dispensed with, the dies being deeper sunk, and thus guiding the counter-die correctly.

Fig. 24, is a plan and section of the dies, h , of fig. 23, separately; by the use of these dies, the edges of horn-buttons will be more accurately formed, and require less finishing.

This description of dies may be made according to the mode described in the fourth part of my invention, that is, by engraving one plate and forming the boundary

circle separately, as will be understood by examining figs. 25 and 26, which shew a plan and side section of a die, complete, with its boundary circle, formed in a similar manner to what was described above, and the parts are lettered with the same letters of reference as similar parts in figs. 18 and 19, and this arrangement of die is suitable to be worked with the counter-die and tube of figs. 20, 21, and 22.

Fig. 27, shews the die in plan and section without the bounding circle, and the bounding circle separately, or the bounding circle may be made deeper, and dispense with the tube, *k*.

Fig. 28, shews a plan and section of a die complete, and of a variation in the means of affixing a separate bounding circle to each engraved surface.

Fig. 29, a plan and section of the engraved surface separately; and,

Fig. 30, a plan and section of the bounding circle separately.

This die is made suitable for working without the tube. In using these dies they are to be heated but slightly, whether for buttons with metal shanks, or to receive flexible shanks, and are to be pressed as heretofore.

Having thus described the nature of my invention, I would wish it to be understood, that I do not confine myself to the precise details, as they may be in some degree varied.

But what I claim, is, first, the mode of manufacturing horn-buttons with flexible shanks, by first forming buttons by pressure and heat, and then by a second pressure in dies, to affix flexible shanks thereto, as above described.

Secondly, I claim the mode of ornamenting horn-buttons, by causing suitable surfaces to be affixed in the front surfaces, by pressing the buttons with the ornaments in dies, as above described.

Thirdly, I claim the mode of ornamenting horn-buttons, by gilding and silvering their surfaces as described.

Fourthly, I claim the mode of constructing dies used in the manufacture of horn-buttons, by applying separate bounding circles to each engraved surface for a button ; and,

Fifthly, I claim the mode of manufacturing horn-buttons in dies, wherein the horn or hoof is prevented being expressed at the circumference of the buttons as described.—In witness whereof, &c.

THOMAS HARRIS.

Enrolled October 22, 1841.

Specification of the Patent granted to PHILLIP WILLIAM PHILLIPS, of Clarence Place, Bristol, Gentleman ; and WILLIAM BISHOP PECK, of Broad Street, Wine Merchant, for Improvements in Wheeled-Carriages. —Sealed February 15, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—

Our invention relates to such description of four-wheeled-carriages, as have two bodies capable of independent motion, and such improvements have for their object better means of connecting two separate bodies in constructing a four-wheeled-carriage, by which the locking action and general character of such description of four-wheeled-carriages will be improved. And in order that our invention may be most fully understood, and readily carried into effect, we will proceed to describe the drawings hereunto annexed.

Description of the Drawing.

Fig. 1, represents a side elevation of a four-wheel-carriage, with two independent bodies constructed according to our invention ; and,

Fig. 2, is an underside view looking from below upwards. *a*, is the fore body, and *b*, is the hind body, which are independent of each other, and have each their

pair of wheels; and the two bodies, *a*, and *b*, are attached by means of what may be called a locking apparatus, consisting of the circular hoop or plate, *c*, affixed on the hind body, *b*, of the carriage. *d*, is a circular hoop or strap, which embraces the hoop, *c*, and turns freely thereon; and the hoop or strap, *d*, is kept in its place by means of circular rings, *c*¹, affixed on the upper and under surfaces of the hoop, *c*, as is shewn, and the nature of these parts will readily be traced on examining the drawings. To the hoop, *d*, is affixed the short pole or bar, *e*, as is shewn, and in order to ensure strength, there are two plates of iron, *f*, welded to the hoop, *d*, and affixed to the bar, *e*, as is shewn. The short pole or bar, *e*, passes into straps, *g, g*, affixed to the under side of the fore body of the carriage, as is shewn, and there are two bolts passing through the bar, *e*, and through the bottom of the fore body, by means of which bolts, and the screw-nuts placed thereon, the bar, *e*, is securely fastened to the fore body, *a*, of the carriage. The two bodies are shewn in outline; but it should be remarked, that the shape or character of the two bodies may be varied, according to the judgment of the builder, our invention not relating to the construction of the two bodies, but to the means of connecting two bodies together so as to obtain a good locking action, with comparatively large fore wheels, without requiring a space between the two carriages for the fore wheels to lock into in going round curves. On the underside of the fore body, *a*, is affixed a plate, *h*, on which the curved end of the fore part of the hind body rests, the curved plate, *h*, being a portion of a circle struck from the centre of the hoop, *c*, by these arrangements the locking action will be very easy and smooth, and the carriage, notwithstanding the height of the fore wheels, will lock or turn with safety in a curve of a very short radius, as will readily be understood on examining fig. 2, where the parts are shewn to be on the lock by dotted lines. On the hoop or strap, *d*, is

affixed a stop, *i*, which limits the extent of the locking motion, such stop, coming against the projecting stops, *j*, on the plate, *c*¹, all which will readily be understood on examining the drawings; and it only remains to be added, that we do not confine ourselves to the arrangement of springs shewn, as they may, if desired, be varied, and, although the carriage above described, is shewn as constructed for a single horse to draw by means of shafts applied to the fore body, *a*, yet, by applying a pole, as is well understood, the carriage may be made suitable for receiving two horses; and, it may be remarked, that by detaching the hind body, *b*, from the fore body, *a*, the fore body may be used as a gig.

We will now proceed to describe another arrangement of a carriage, having two separate bodies, connected by a peculiar locking apparatus.

Fig. 3, represents a side elevation of a carriage constructed according to our invention.

Figs. 4, and 5, shew underside views, looking from below upwards; Fig. 4, shewing the parts in the positions they would appear when the carriage is being drawn in a straight line; and, fig. 5, shews the parts in the positions they would assume when locking. In these figures the same letters are used to indicate the same parts as those before described, where the parts in the present carriage are similar to those above described. In place of the circular hoop or ring, *c*, which serves as an enlarged axis on which the fore body locks, in respect to the hind body, in the present arrangement, there is the grooved plate, *k*, affixed to the under surface of the hind body; and to the underside of the fore body, *a*, is affixed the bar, *l*, which has a projection, *m*, affixed at its upper surface, such projection, *m*, working in the groove, *k*; and it is prevented coming out of such groove by having an enlarged head, which works within the plate, *k*. *n*, is a connecting rod or link, attached by pin joints to the hind bodies, as is shewn, and to the bar, *l*, and the groove, in

the plate, *k*, is composed of two arcs of a circle, struck from the fore pin joint of the link or connecting rod, when that joint is in the position of the two extreme locking points of the fore body. *o, o*, are two stops to the bar, *n*; in other respects the parts of the carriage are similar to what has been above described, and the same observations as were made with regard to the shape and character of the bodies, and the arrangement of springs, and the drawing by one or two horses, also apply to this carriage.

We will now describe another arrangement or construction of locking apparatus, for a carriage having two separate bodies.

Fig. 6, shews a side elevation of a carriage, constructed according to our invention.

Figs. 7 and 8, shew two plans or underside views, looking from below upwards. In these figures the same letters are used to indicate similar parts to those before described. In this case there are two curved locking-bars used for connecting the fore and hind bodies, *a* and *b*.

Fig. 9, shews one of the curved locking-bars separately, the other being similar, but bent or curved in opposite directions; these bent or curved bars work in curved grooves, formed in plates affixed to the under parts of the fore and hind bodies, such curved grooves being, when closed together, as shewn in fig. 7, of a similar figure, to the bars which work therein; but the curved groove of each bent or curved bar is one-half affixed on the fore body, and one-half on the hind body, as will readily be understood on examining the drawing. *p*, is one of the curved bars which works in the grooves, *p*¹, *p*¹; and *q*, is the other bent or curved bar which works in the groove, *q*¹; and it should be stated, that the grooves, *p*¹, *q*¹, are covered over and the bars enclosed, when in action; but the covering is not shewn, in order that the action may be more readily traced. And it will readily be understood, on examining the drawing, particularly fig. 8, where the parts

are shewn on the lock, that the fore body, when moving or locking in the direction shewn in the drawing, will cause the part of the bent or curved bar, p , which works in the part of the groove, p^1 , which is affixed to the fore body, to be drawn out a distance in proportion to the sharpness of the curve the carriage is moving in, whilst that part of the bent or curved bar, p , which works in the part of the groove, p^1 , affixed to the hind body, will remain within the groove; and at the same time, the part of the bent or curved bar, q , which works in the part of the groove, q^1 , affixed to the hind body, will be drawn out of that groove, and the other part of the bar, q , which works in the part of the groove, q^1 , affixed to the fore body, will remain in that part of the groove, and when locking in the opposite direction, the reverse of these movements will take place. On the bars, p and q , are affixed hinges, r and s , by which the angles of the two bodies are hinged together, thus the bar, p , by a hinge-joint, is attached to the fore body at the point, r , and to the hind body by a hinge-joint, r^1 , and the bar, q , is attached to the fore body by a hinge-joint, s , and to the hind body by a hinge-joint at the point, s^1 . t , t , are stops to the bars, p and q , to control the extent of locking of the fore body in respect to the hind body. In this carriage very high wheels are used, and yet the locking is very safe and easy.

We would remark, that the observations before made with respect to the shape and character of the bodies, and of the arrangement of the springs, and of the adopting the carriage to be drawn by two horses, apply to this carriage.

Having thus described the nature of our invention, and the manner of performing the same, we would have it understood, that we do not confine ourselves to the precise arrangements of details shewn, provided the general character of either of the locking apparatus in combination with two independent or separate bodies, be retained; but what we claim as our invention is, first, the mode of constructing four-wheeled carriages with two separate

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bodies, when combined with locking apparatus, such as is described in respect to figs. 1 and 2.

Secondly, we claim the mode of constructing four-wheeled carriages with two separate bodies, when combined with locking apparatus, such as is described in respect to figs. 3, 4, and 5; and,

Thirdly, we claim the mode of constructing four-wheeled carriages when combined with locking apparatus, such as is described in respect to figs. 6, 7, 8, and 9.—In witness whereof, &c.

PHILLIP WILLIAM PHILLIPS.

WILLIAM BISHOP PECK.

Enrolled August 15, 1841.

Specification of the Patent granted to JOHN CARR, JUNIOR, of Paddington, in the County of Middlesex, Engineer, for Improvements in Apparatus for Retarding and Stopping Railway Carriages.—Sealed May 20, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—

The object of my invention is an improved mode of arranging apparatus for applying friction-breaks to the wheels of railway carriages.

Description of the Drawing.

The drawing shews a plan, a longitudinal section, and a side elevation, of so much of the framing and wheels of a railway carriage, with apparatus applied thereto according to my invention. In each of these figures the same letters indicate similar parts: *a, a, a*, are the wheels of the carriage; the drawing representing part of a carriage which has six wheels; but the invention is equally applicable to carriages with four wheels. *b, c, b, c, b, c*, represent the friction-blocks, which are suspended by arms, *d, d, d*, to the side-framing of the carriage, as is shewn,

and are capable of moving on their points or axes of suspension, and thus allow of being pressed in contact with the wheels, or kept off therefrom by the simple act of moving the rod or bar, *e*, in the following manner: *f*, is an arm or lever moving with its axis at *g*, which is carried by a bracket, *h*, affixed to the under part of the framing of the carriage, as is shewn. At the end of the arm, *f*, is a screw-nut, which moves on axes or necks carried by the forked-end of the arm, *f*, through the screw-nut at *f'*, passes the screw, *i*, which is supported above at *j*, and turns freely, by means of the handles, *k*, and thus is the arm or lever, *f*, caused to move, and at the same time the arm, *l*, (affixed to the axis, *g*), is caused to move with that axis, and thus will motion be communicated to the rod or bar, *e*, as will readily be understood on examining the drawing; and by moving the rod or bar, *e*, motion will be given to the friction-blocks, *b*, *c*, in opposite directions, by means of the curved levers, *m*, *m*; these levers move on axes, *m*¹, carried by brackets, *n*, *n*, affixed to the under-part of the framing, as is shewn; and *n*¹, *n*¹, are stays by which the pressure of the friction-blocks, *b*, *c*, are resisted. *l*¹, *l*², *l*³, *l*⁴, *l*⁵, are arms affixed to the axes, *m*¹; they enter slits or openings formed in the rod or bar, *e*, and are there secured by pin joints, as are shewn. The curved levers, *m*, have projecting flanges, which work within guiding-brackets or bent projections, *m*², affixed on the blocks, *b*, *c*, and thus, in the movement of the curved levers, they are retained correctly in respect to their blocks, and will move the blocks away and retain them from their wheels when not required to be in action. The drawing shews the various parts of the apparatus in the positions they would be in when the blocks, *b*, *c*, are out of use; and supposing it desired to put the breaks into action, the arm, *f*, would be raised by the screw, *i*, by which the bar would be moved in the direction of the arrows, which would cause the arms, *l*, *l*¹, with their respective curved levers, *m*, to move, and thus to press

their blocks, *b, c*, towards each other, and thereby offer friction to the wheels at opposite sides of the axle-tree, the pressure being borne by the axes of the curved levers, *m*, and resisted by the stays, *n*¹; and each of the wheels will be similarly acted on by their blocks, *b, c*, and thus may any required degree of friction be applied to the wheels, according as it is desired to retard, or wholly to stop, the rotation of the wheels, *a, a*, of the carriage.

I would remark, that I do not confine myself to the precise details of the above described apparatus, provided the peculiar character of action be retained, whereby the movement of a bar or rod, *e*, causes a series of friction-blocks to be pressed against their respective wheels, and whereby the pressure of the blocks are borne by suitable stays, as above described. And I would remark, that although I have shewn the apparatus as applied to the wheels of only one side of a carriage, similar apparatus may be applied to each side of a carriage, if desired.—In witness whereof, &c.

JOHN CARR, JUNIOR.

Enrolled November 20, 1841.

Specification of the Patent granted to HENRY DIRCKS, of Liverpool, in the County of Lancaster, Engineer, for certain Improvements in the Construction of Locomotive Steam-Engines and Wheels, to be Used on Rail and other Ways, part of which Improvements are applicable to Steam-Engines generally.—Sealed May 12, 1840.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—

The first part of my invention, namely, improvements in the construction of locomotive steam-engines, consists in a novel arrangement and construction of exhaust or exit-pipe, by which the exit-steam from the cylinders is

conducted into the chimney; and at the same time is caused to act upon the gas, smoke, or heated air at the back end of the tubes in the boiler in very small jets, and thus prevent or consume the smoke from the furnace in those engines where coal is used, and the boiler is of the tubular construction. The principal feature of this improvement consists in forming the exhaust or exit-pipe, which is placed in the smoke-box of the engine, as usual, into a series of small branches or tubes, and so arranging or spreading these tubes that they may be opposed to most of the ends of the boiler-tubes in the smoke-box, and as the exhaust-branches or tubes are perforated with small holes on that side of the pipes opposed to the tube-ends, the steam will blow out upon the orifices at the ends of the boiler-tubes in very fine jets, and thus prevent the emission of smoke; this part of my improvements being applicable to steam-engines generally.

Secondly, my improvements in the construction of wheels to be used upon rails or other roads or ways, consist in forming the tyre of the wheel of cast or wrought-iron, having a channel or groove formed in it, to be filled with blocks of wood, having the grain of the wood placed vertically or endways all round in segments, which are afterwards bolted or rivetted, or otherwise fastened in the channel of the tyre, and present a wooden-faced rim or running surface to the road or way. The wood I prefer to be used for this purpose is African oak, British oak, beech, or other hard wood, previously soaked or saturated with coal-gas tar, and impregnated therewith by means of hydraulic or other pressure, in order to fill up its pores and thus prevent the admission of moisture. Instead of the use of hard woods, softer timber, such as larch, &c., may be employed, and previously squeezed or pressed into more perfect solidity; and I would remark also, that the wood may be otherwise chemically prepared, in order to prevent the admission of moisture to the pores, or they may be filled by any oily substances, being either pressed into the pores

of the timber, or introduced by vacuum or other means. In order that these improvements may be perfectly understood, I have attached to these presents two sheets of drawings, and have marked the same with figures and letters of reference corresponding with the following description thereof.

Description of the Drawings.

In sheet 1, fig. 1, represents a transverse section taken vertically through the smoke-box of a locomotive engine-boiler; and, "

Fig. 2, a longitudinal section of the same, exposing the ends of the boiler-tubes, the cylinders, and the exit or exhaust-pipes. The smoke-box is represented at *a, a, a, a*, attached as usual to the end of the boiler, *b, b, b*. The boiler-tubes are shewn at *c, c, c, c*, open as usual into the smoke-box. The steam-cylinders, *d, d*, communicating as in common with the exhaust or exit-pipe, *e, e*; this pipe, instead of now being carried upwards directly into the chimney, *f*, as usual, is branched or spread in several small pipes or tubes, *g, g, g, g*, perforated with small holes on the sides opposed to the tubes, *c, c, c, c*, and are then again connected at their upper ends to the exhaust or exit-pipe, *h*, leading to the chimney, *f*. There is also an auxiliary pipe, *i, i*, the cock of which is to be opened by the engine man to supply steam from the boiler to the branch pipes, *g, g, g, g*, when the engine is stationary, and the supply cut off from the cylinders. The steam thus blowing out of the perforated exhaust-pipes, *g, g*, opposite the back end of the boiler-tubes, will thus prevent the passage of smoke to the flue or chimney.

In sheet 2, fig. 1, represents a front view of my improved wheel.

Fig. 2, a side or edge view of the same; and,

Fig. 3, a section taken vertically through the middle of the wheel. *a, a, a, a*, represents the ordinary parts

of a cast or wrought metal wheel, having the rim or tyre formed as a channel or groove, in which are placed the several segments of wood, *b, b, b, b*, having the grain placed vertically and extending around the tyre, in order to form the running or outer periphery; these segments of wood may be fastened into the metallic channel by various means, by bolts or rivets, as shewn at *c, c, c, c*, or by turning a groove, half in the metal and half in the wood, and running metal therein, as shewn at *d, d*.

Figs. 4 and 5, represent detached segments, and shew either mode of fastening them to the metallic body of the wheel.

Having now fully described the nature of my said invention, and the manner in which the same is to be performed, I wish it to be understood, that I claim as my invention, firstly, the improved construction and arrangement of the exhaust or exit-pipe used in combination with tubular-boilers, in the manner and for the purposes herein set forth; and,

Secondly, the combination of a metallic wheel, with a wooden-faced tyre, as before explained, without being confined to its precise mode of construction or putting together.—In witness whereof, &c.

HENRY DIRCKS.

Enrolled November 12, 1840.

Specification of the Patent granted to GEORGE PHILCOX, late of Southwark Square, but now of Wellington Street, London Bridge, both in the Borough of Southwark and County of Surrey, Watch Maker, for certain Improvements in Chronometers, Watches, and other Time Keepers.—Sealed July 6, 1839.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—
My invention of certain improvements in chronometers,

watches, and other time-keepers, relate to a method of constructing the escapements of chronometers, watches, and other time-keepers, and consist in the novel arrangement, construction, and adaptation of peculiarly formed levers, impelling and detent pieces, by means of which I construct a more simple and less expensive escapement than those in present use. My improved escapement is composed of two parts or levers, viz., the propelling-lever, which receives its power of action from the main spring of the time-keeper, and the detent or balance-lever, which receives its impulse from the impelling-lever. The latter lever, from its peculiar form, I call the diamond lever; and to distinguish my patent escapement from others, I intend to denominate it, "The Patent Diamond Lever Escapement." And I will now refer to the drawings hereunto annexed, the better to illustrate my invention.

Description of the Drawings.

Fig. 1, represents an elevation or diagram of my improved escapement upon an enlarged scale, as detached from the other parts of the mechanism of the time-keeper, the balance and propelling levers being shewn in the drawings, as separated or away from each other, in order better to exhibit the same, it being understood, that when in action they are in contact with each other.

Fig. 2, is a plan or horizontal view of fig. 1. The same letters of reference are used to indicate corresponding parts in all the figures. *a*, is the balance-wheel mounted on the axle, *b*; before this wheel is mounted, the balance or receiving impulse-lever, *c*. The propelling-lever receiving its power of action from the main spring in the ordinary manner is shewn at *d*; mounted on its axle or shaft, *e*; and on the lower part of this lever is placed the locking or detent-lever, *f*, seen best in fig. 2. As the axle, *e*, turns on its centre, one of the ends of the locking-lever, *f*, is brought, by the force of the main spring, against or into coincidence with a ruby palate or stop-

piece, *g*, on the axle, *b*, of the balance, see fig. 1, whereby the locking of the escapement is effected. But instead of the ruby-palate, a notch or groove may be formed on the axle, *b*, itself. I do not, however, claim any part of the locking or its mechanism as my invention, for any other suitable arrangement of locking may be used or applied with my improved escapement-levers, therefore it is not necessary for me to describe it more particularly. Below the locking-lever, *f*, is mounted a small pinion, *h*, see fig. 1, which is in communication with the ordinary train of wheels leading from the first mover, as will readily be understood by watch-makers. The dotted lines, *i*, *j*, *k*, in fig. 2, are intended to shew the points of contact between the two levers, *c* and *d*, when in action in their motion through an escapement. The first point of action is at *i*, where the balance first receives the impulse of the impelling-lever. The second point of action of impulse is at *j*, and the third point at *k*. The escapement above described is intended for chronometers and watches, it may, however, be adapted to clocks and other time-keepers; but for these I prefer the arrangement shewn in fig. 3. It will be seen in this modification of my improved escapement that there are two propelling-levers and two locking-levers. This arrangement of double impelling-levers is for the purpose of obtaining the necessary number of beats within an hour, with the ordinary train of three wheels of a clock-movement. The arrangement shewn in figs. 1 and 2, may be employed for clocks; but in order to gain the necessary number of beats, an additional wheel and pinion must be used, I therefore prefer the arrangement shewn in fig. 3, as it is simple in its construction, and because it may be adapted to the ordinary train of three wheels, as will be well understood by all clock-makers.

Figs. 4, 5, and 6, represent, on a large scale, the balance and propelling-levers in the three different positions of motion or action (that is to say) as the three points of

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contact, or striking in the course of resistance:—Fig. 4, shews the first point of action; fig. 5, the second; and fig. 6, the third or last point, when the impelling or impulse-lever leaves the balance-lever.

Having thus described my improvements, and the manner of carrying the same into effect, I wish it to be understood, that I claim, as the invention secured to me by the hereinbefore in part recited letters patent, the adaptation and application to the escapements of time-keepers, of the impulse or propelling and balance or receiving-levers, constructed and arranged as hereinabove shewn and described.—In witness whereof, &c.

GEORGE PHILCOX.

Enrolled January 6, 1840.

Specification of the Patent granted to THOMAS GADD MATTHEWS and ROBERT LEONARD, of the City of Bristol, Merchants, for certain Improvements in Machinery or Apparatus for Sawing, Rasping, or Dividing Woods, or Tanner's Bark.—Sealed May 5, 1840.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—

Our invention of improvements in machinery or apparatus for sawing, rasping, or dividing woods or tanner's bark, consists in certain arrangements of circular saws, by means of which we are enabled to reduce wood or bark to a finely divided state, for the use of dyers or canners, in a more economical and expeditious manner than has been effected heretofore. The peculiar feature of the invention is combining or attaching a number of circular saws upon a rotary spindle, in such an arrangement, that although not in immediate contact, they are placed so nearly contiguous to one another, that when any piece of wood or quantity of bark is brought under their operation, it will be sawn, rasped, or reduced to a finely divi-

ded condition without leaving any veneer. But in order that our invention may be more clearly understood, we have attached to these presents a sheet of drawings, in which we have shewn the arrangement of mechanical parts whereby we carry our invention advantageously into effect.

Description of the Drawing.

Fig. 1, is a plan view ; and,

Fig. 2, a side elevation of the apparatus. In each of these figures similar letters of reference indicate corresponding parts. The circular saws, *a, a*, are attached to a spindle, *b*, which is mounted in adjustable bearings. The peculiar construction of the saw-barrel will be seen upon inspecting the drawing, fig. 1. The circular saws or discs of metal are mounted on their spindle, at an oblique angle thereto, and the spaces between each saw is filled up or occupied by pieces of wood, felt, metal, pasteboard, or other suitable substance. The saws, when properly arranged upon the spindle, are then screwed up between two chucks, by means of the bolts and nuts, *c, c, c, c*. As the saws become worn away by frequent use, the bearings, which carry the shaft on which they are mounted, must be brought forward a little : this is effected by means of the adjusting-screws, *y, y*. The log of wood is shewn at *d, d*, and is brought under the operation of the rotary-saws at *e*, by means of the gearing, shewn in the drawing, and hereafter described, assisted by the gravity of the wood itself. By these means it is caused to slide or move down the inclined trough, *f, f, f*, as its lower end becomes sawn or rasped away by the action of the rotary saws. The upper end of the log is kept steady by the pins or spikes, *g, g*, which are attached to the end of the sliding-rack, *h*. A counter balance-weight, *i*, is attached to the other end of the rack, *h*, by a cord or chain, *j*, which passes over a pulley, *k*. This weight is intended to facilitate the operation of pulling up the rack,

when a fresh log is intended to be placed in the trough, *f, f*, to be operated upon. Fast and loose pulleys, *l, l*, are mounted on the driving-shaft, and rotary motion is communicated to them from a steam-engine or other prime mover. On the same shaft are mounted other pulleys, *m, m*, which communicate motion by means of a strap to the pulleys, *n, n*, which are mounted on a shaft, *o*, above. A bevil friction-wheel, *p*, is mounted on the shaft, *o*, and revolves in contact with the larger bevil friction-wheel, *q*, which is mounted loosely on the upright shaft, *r*; and by means of a common clutch-box, *v*, mounted on the upright shaft, *t*, immediately below the wheel, *q*, the said shaft is made to revolve in its bearings. A worm or endless screw, *s*, is formed on the shaft, *r*, and as it revolves, it communicates a slow rotary motion to the large worm-wheel, *t*, on the axle of which a pinion, *u*, is mounted. This pinion gears into the sliding-rack, *h*, and causes it slowly to move down the trough, *f, f*, and thereby keep the log of wood constantly under the operation of the rotary-saws. When a fresh log of wood is required to be operated upon; the under part of the clutch-box, *v*, is lowered by means of the lever and rod, *w*, so as to throw the two parts of the said clutch-box out of gear, then, upon turning the axle, *x*, on the axis of the worm-wheel and pinion, will be turned back, and by that means the sliding rack will be brought back again into its original position, as shewn in fig. 2.

Having now described our invention, and the manner of carrying the same into effect, we wish it to be understood, that we do not intend to confine ourselves to the precise arrangement of mechanism herein shewn, as it may be varied in different ways without departing from the principle or nature of our invention; but we claim as the invention secured to us by the hereinbefore in part recited letters patent, the application of rotary circular saws to the sawing, rasping, or reducing to powder, of woods or tanner's bark, for the use of dyers or tanners,

for Sawing, Rasping, and Dividing Woods, &c. 27

in whatever manner the said saws may be applied.—In witness, &c.

THOMAS GADD MATTHEWS.

ROBERT LEONARD.

Enrolled November 3, 1840.

Specification of the Patent granted to THOMAS WILLIAM BOOKER, of Melin Griffith Works, near Cardiff, Ironmaster, for Improvements in the Manufacture of Iron.—Sealed February 22, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My invention consists of a method of simplifying and accelerating the conversion of cast-iron from its crude state, into malleable or wrought iron; and my mode of effecting the same is as follows :—

I construct an open refinery or furnace, A, in the form and position with reference to the reverberatory or puddling-furnace, B, with which it is connected, as shewn by the drawing. I adapt my said refinery to the various qualities or descriptions of cast-iron or pig-iron, which it may be necessary to use, by surrounding or inclosing the hearth with blocks of cast-iron, into and through which water is allowed to flow or not, as may be expedient, and as is well understood in making refinery-furnaces; and I introduce and apply the blast of air through one, two, or more apertures, or twires, as heretofore. The form, dimensions, and constructions of the said refinery for the conversion of cast or pig-iron of the ordinary description used in England, Wales, and Scotland, for the manufacture of wrought, or malleable, or bar-iron, are shewn by the said drawing. I construct a reverberatory or puddling-furnace, B, of the dimensions, shape, and construction, and, in the position with reference to the refinery,

A, as shewn by the drawing. The bottom of the body of the furnace, and the grate-bars and binding-plates, and bars are formed of iron. The other parts of the furnace are constructed with fire-bricks, sand-stones, or fire-clay, as is well understood. In the neck or near the flue of the said reverberatory-furnace, is an aperture through which the iron, when it has become decarburetted or refined in the refinery, A, is introduced or run in a fluid state direct from the refinery hearth into the puddling or reverberatory furnace; on each side of which reverberatory furnace I construct a door; the door on the one side being opposite to the door on the other side, as shewn by the drawing; through which two doors the workmen perform the process of puddling in the ordinary way in which puddling is done, when only with one door, which is the general practice. The means and method of charging and working the iron, which I adopt and recommend, are as follows:—

As respects the refinery—Having thrown up the fuel, and having, by the application of fire and blast, produced the necessary heat, throw thereon a charge of nine cwt., or thereabouts, of pig or cast-iron, of the description generally used for forge purposes. Let this be melted down, and decarburetted or refined in the ordinary way; and when the refining process is complete, let the whole charge of metal be run off in a fluid state direct into the reverberatory or puddling-furnace, previously prepared to receive it, by having been already heated to a degree of temperature, and by the bottom, sides, bridge, and opening to the flue being protected in the ordinary way, by the workman having previously thrown in a sufficient quantity of lime-stone and iron cinder. The metal having been introduced into the reverberatory or puddling-furnace in a fluid state, the workman will raise, apply, regulate, and vary, the heat in the ordinary way, by feeding and moving the fire in the grate, and raising or lowering the damper on the top of the stack or flue, as circumstances may require, and as is well understood;

they must at the same time stir and agitate the iron with bars and puddles, while the escape of the oxide of carbon in a gaseous shape takes place, and until the whole mass of iron agglutinates, the workmen will then divide it into lumps or balls of a convenient size, and draw the charge from the furnace, passing the lumps to the squeezer-hammer, or rolling-cylinders, or such other contrivance or machinery as may be used for forging or compressing the iron, all which is well understood. During the process of refining the iron by the application of heat and blast in the open refining hearth, a considerable quantity of scoria or cinder will be produced, which is to be tapped and run off as heretofore, as circumstances may require ; but it is to be observed, that during the process which the iron undergoes in the reverberatory or puddling-furnace, I do not find that any cinder need be generated or produced, and cinders and lime-stones are to be thrown in, as already described, for the protection of the various parts of the furnace exposed to the action or agitation of the fluid-metal, but no cinder need be tapped or drawn off.

Having thus described the nature of my invention, and the best manner I am acquainted with for performing the same ; I would have it understood, that I do not make any claim to the construction of refinery-furnaces, nor puddling or reverberatory-furnaces, such as are shewn in the drawing ; nor do I confine myself to the precise construction thereof, so long as the peculiar character of my invention be retained ; my invention not being in the construction of furnaces, but relates to the mode of manufacturing iron by refining and puddling, by causing the heated metal of the refinery process to be passed into a puddling furnace, without being first permitted to cool, as herein described.—In witness, &c.

WILLIAM BOOKER.

Enrolled August 22, 1841.

Specification of the Patent granted to RICE HARRIS, of Birmingham, in the County of Warwick, Gentleman, for certain Improvements in Cylinders, Plates, and Blocks, used in Printing and Embossing.—Sealed May 12, 1840.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—
The first part of my invention applies to such cylinders, plates, and blocks, to be used in printing or embossing cotton, linen, woollen, silk, or other similar fabrics, as are made of, or coated, or covered with the vitrified substances here mentioned, instead of the cylinders, plates, and blocks now used for those purposes; and the other or second part of my invention applies to the use or application of tubes or linings within such of the cylinders used in printing and embossing cotton, linen, woollen, silk, and other similar fabrics, as are made of copper or brass, or any other expensive material, whereby I am enabled to make such cylinders with a smaller quantity of the more expensive material than is necessary for that purpose according to the mode now used in making such cylinders, and without requiring any increase in the weight or size of the mandrils or axes of such cylinders. The vitrified substances, which I use for carrying into effect the first part of my invention, are glass and enamel, and such other vitrified substances as contain silicia and boracic acid, or either of them, sufficient to render the cylinders, plates, and blocks, which are made of, or coated, or covered with the same, capable of being etched by the action of hydrofluoric acid, either alone or in combination with ammonia or some other base. These vitrified substances may also be engraved by the usual process of engraving on glass. These vitrified substances may be composed of various materials: but I will describe the manner in which I make that which I prefer to use for making cylinders,

plates, and blocks, and which I have always found to contain sufficient, and the manner in which I apply it to the making of cylinders, plates, and blocks. I take 28 parts by weight of well cleansed white sand, 35 parts by weight of red lead, 14 parts by weight of soda ash, 7 parts by weight of nitrate of soda, 7 parts by weight of calcined iron-scales, 7 parts by weight of boracic-acid, in the state of refined borax, 7 parts by weight of calcined copper, 7 parts by weight of oxide of manganese, and 20 parts by weight of pulverized flint-glass; and I mix these well together. I put the mixture into a large crucible or pot, and then place it in a furnace similar to the furnaces used in the ordinary manufacture of flint-glass, and heated in a similar degree, and I continue to apply heat to the furnace. When the whole, or nearly the whole, of the volatile gas contained in the mixture has been thus disengaged, I transfer the mixture, whilst in a fluid state, into smaller crucibles or pots, convenient to be used in casting, and put it, as it is contained in such crucible or pots, into a furnace, similar to the furnaces used in the manufacture of plate-glass, and heated in such manner as to keep the mixture in a fluid state; and I continue the mixture in such furnace so heated until I require it for use, as hereinafter mentioned. The apparatus to be used in casting must be varied according to the articles intended to be made, whether such articles are cylinders, plates, or blocks made of glass, enamel, or such other vitrified substances, as hereinafter mentioned, may be cast in any suitable mould; but for casting cylinders, I use such an apparatus as is described in the figs. 1 and 2 of the drawings hereunto annexed, the same letters being used in each of these figures for denoting the corresponding parts of such apparatus.

Description of the Drawings.

Fig. 1, represents an elevation of such apparatus; and, Fig. 2, a vertical section, taken through the middle of

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the same. *a*, is a cylindrical mould of cast-iron or other suitable material, formed in three pieces, braced together by flanges and bolts, and fitted at the bottom to the foundation-plate of an ordinary screw-press. *b*, is a hollow tube also fitted to the foundation-plate of the press, and constituting a core for forming a cylindrical opening through the intended cylinder. *c*, is a funnel fitting loosely upon the mould, *a*, and provided with ears or lugs, which slide upon the vertical guide-rods, *d*, *d*, of the screw-press. *e*, is a piston or plunger fitting on the interior of the mould, *a*, and attached to the screw of the press in any ordinary manner. This piston or plunger has a cylindrical passage to receive the tube or core, *b*, when the piston or plunger is screwed down. *g*, represents a pipe communicating at one end with a tank of water placed at an elevation above the waste-pipe, *h*, hereinafter mentioned, and connected at the other end, with the interior of the tube or core, *b*, for supplying a current of water to prevent such tube or core from becoming fused, and adhering to the vitrified matter used in forming the cylinder. *h*, represents another pipe, being the waste-pipe, attached to the top of the tube or core, *b*, for the purpose of carrying off steam, and the surplus water supplied through the pipe, *g*, after the tube or core, *b*, is filled; and the piston or plunger, *e*, having a slot or opening at *i*, to provide for the piston or plunger descending, whilst the waste-pipe, *h*, remains stationary. In using this apparatus, I pour the vitrified matter from the smaller crucibles or pots, hereinbefore mentioned, into the mould, *a*, by means of the funnel, *c*, and then screw down the piston, *e*, in order to compress the matter in the mould; I fasten the piston to the funnel by means of the screws, *k*, *k*, and by means of the screws, *e*, I fasten the upper end of the core also to the piston. I allow the vitrified matter to remain in the moulds until it is sufficiently cool to be removed, and thus the cylinder is formed; I then raise the

piston or plunger, *e*, and the tube or core, *b*, and the funnel, *c*, which will have been fastened or attached together, as already mentioned, by means of the screw of the press, and the cylinder is ready to be annealed. For the purpose of annealing the cylinder, I prefer to take the mould, *a*, to pieces, and to remove the cylinder therefrom, and put it into a case of sheet-iron, which is open at one end, and which is made larger than the cylinder, to provide for a vacant space being left on every side between the cylinder and the case. I put the cylinder as nearly into the middle of the case as may be, and then fill the vacant spaces within the case with powdered charcoal, and close the end of the case, in any convenient manner, to exclude atmospheric air as much as may be. I then put the case into an annealing arch or kiln, similar to the annealing arches or kilns in general use, in the manufacture of articles of glass, and the process of annealing may be conducted in the same way as is commonly done in such manufacture; but I prefer to suspend the iron case, which I use as before mentioned, containing the cylinder during the operation, in order that the case may be surrounded by or entirely exposed to the heat within the arch or kiln. If it is desired that the cylinder should be annealed without this process, it may be put into the annealing arch or kiln without being removed from the mould, and the mould may be suspended in such arch or kiln. When the cylinder has been annealed, it is prepared for being ground; and it may be ground smooth and polished by any convenient means for grinding, smoothing, and polishing glass; but for these purposes I prefer to use a mill with a revolving disc, plates and blocks, made of such vitrified substances as hereinbefore mentioned, may be annealed in the ordinary manner of annealing glass; and they may be ground, smoothed, and polished, either upon a revolving disc, or in the ordinary manner of grinding, smoothing, and polishing plate-glass. If it is desired to use cylinders, plates, or blocks of any other suitable ma-

terial, not being such vitrified substances, as hereinbefore mentioned, for printing or embossing such fabrics, as are hereinbefore mentioned, such cylinders, plates, and blocks, may be coated or covered with any such glaze or other substance capable of vitrification, suitable to the material of which such cylinders, plates, or blocks, may be made, as contains a sufficient quantity of silica and boracic-acid, or either of them, to provide for the required patterns or devices being etched on such coating or covering by the action of hydrofluoric-acid alone, or in combination with ammonia, or other base; and such cylinders, plates, and blocks may be coated or covered with such glaze or other substance, and this glaze or other substance afterwards vitrified in the same manner as is in general use for glazing porcelain. When cylinders, plates, and blocks, made of such vitrified substances, as hereinbefore mentioned for that purpose, have been ground, smoothed, and polished; and when cylinders, plates, and blocks, made of any other suitable material, have been sufficiently coated or covered with such vitrified substances, as hereinbefore mentioned for that purpose; they are respectively prepared to receive patterns or devices by etching or engraving. As to engraving, I have already stated the mode; as to etching, this is capable of modifications. I shall describe two modes of etching which I adopt; viz., according to one, I heat the cylinders, plates, and blocks gradually by any convenient means, until they are sufficiently warm to melt common etching-wax, and I then cover them with a slight coating of such wax, and transfer the pattern or device intended to be etched to the coating of wax by any means in ordinary use for that purpose; and when cylinders or plates are to be etched, I remove those portions of wax to which the pattern or device has been transferred by means of a pointed instrument, or other convenient tool or machine; but when blocks are to be etched, I in like manner remove those parts of the wax to which the pattern or device has not

been transferred; and after the wax has been thus removed, I immerse the cylinders, plates, and blocks in hydrofluoric-acid, and keep them in such acid until the pattern or device is sufficiently bitten or corroded in.

Another mode which I adopt is as follows:—I take of white wax one ounce, asphaltum one ounce, burgundy pitch half an ounce, common pitch half an ounce, and melt these materials in a glazed earthenware pot over a slow fire. I then allow the mixture to cool and make it into balls. I enclose these balls in a silk bag, and lay a ground of the mixture upon the cylinders, plates, and blocks, to be etched in a similar manner to that practised by copper-plate engravers in respect to copper-plates. I then place the pattern or device, drawn on thin paper, upon the cylinder, plate, or block; and for cylinders or plates, I go over the lines of such pattern or device with a soft black lead-pencil, and shade the some according to the ordinary mode of executing a pencil-drawing; but for etching blocks, I go over the other parts of the paper with a similar pencil, and shade it so as to leave the pattern or device. I then remove the paper; and the mixture, with which the cylinder, plate, or block was covered, is removed, with the paper, from those parts over which the pencil has pressed, leaving such parts exposed. I then submit the cylinder, plate, or block to the action of hydrofluoric-acid, in the same manner as I have already described for that purpose. After the cylinder, plates, or blocks have been subjected to the action of the hydrofluoric-acid, any portions of the pattern or device may be stopped out in any convenient manner, and the cylinders, plates, or blocks may be again immersed in the acid to complete or improve the pattern or device. Before the cylinders, which are made of glass, enamel, or other such vitrified substances, as hereinbefore mentioned, are fit for use in printing or embossing, they must be adapted to a mandril or axis, and for this purpose a tube or lining of iron, or compressed wood, or

other suitable material, is to be fastened or screwed to such cylinders by any convenient mode. I prefer the mode hereinafter described, in reference to the second part of my invention, for fastening or securing tubes or linings to cylinders of copper, or brass, or other expensive material.

I will now describe the means by which I carry into effect the second part of my invention, it consists of tubes, or linings of iron, or compressed wood, or other suitable material, to be put into cylinders of copper, brass, or other expensive materials, to be used in printing or embossing such fabrics as aforesaid, for the purpose of reducing the quantity of the more expensive material required to make such cylinders, and thereby reducing the expense of the same, without requiring any increase in the weight or size of the mandrils or axes of such cylinders. In order that this part of my invention may be most fully understood, I have annexed in this my specification, figs. 3 and 4, of the drawings hereunto annexed, the same letters being used in each of these figures for denoting the corresponding parts in such figures.

Fig. 3, is a cylinder, with this part of my invention applied thereto, drawn in section at one end thereof; and,

Fig. 4, is a cross section of such cylinder. A, is the cylinder. B, is the tube or lining which is cemented to the cylinder throughout its length, and has each end formed as a screw projecting beyond the cylinder, for the purpose of receiving the taps or nuts, c, c, to screw and attach it by the ends to the cylinders, a. d, is a rib or feather-edge upon the tube or lining, b, and fitting into a corresponding groove upon the axis or mandril, in the usual manner of mounting cylinders for printing and embossing the fabrics before mentioned. The tube or lining, b, may be of any convenient thickness, and may be made of cast or wrought-iron, or compressed wood, or other suitable material; but I prefer wrought-iron; and the rib or feather-edge may be fixed into the mandril, and

the corresponding groove, formed in the tube or lining, *b*, if this is thought to be more convenient.

Now I hereby declare, that I claim as my invention only, first, the manufacture of cylinders, plates, and blocks, made of or coated or covered with glass, or enamel, or any other vitrified substance, containing silica and boracic-acid, or either of them, sufficient to render such cylinders, plates, or blocks capable of being etched by the action of hydrofluoric-acid alone, or in combination with ammonia, or other base, and to be used in printing or embossing cotton, linen, woollen, silk, or other similar fabrics ; and,

Secondly, the use or application of tubes or linings for cylinders made of copper, brass, or other expensive materials, for printing or embossing cotton, linen, woollen, silk, and other similar fabrics. By which part of my invention such cylinders are, as hereinbefore appears, made with a smaller quantity of the more expensive materials of which they are now usually composed, or without requiring an increase on the weight or size of the axes or mandrils to be used with the same.—In witness, &c.

RICE HARRIS.

Enrolled November 12, 1840.

ORIGINAL PAPER.

Registration of Designs. BY WILLIAM CARPMAN, Esq.

IN many branches of our manufactures much money is annually expended in the designing and producing patterns, for which, formerly, no legal protection could be obtained ; and it constantly happened that when a pattern was brought out, in any department of manufacture, which was approved of by the public, other persons, en-

gaged in the same trade, quickly copied the successful pattern; and, having paid nothing for the design, the copyist could bring the articles, made according to the design, into the market at a reduced price, thereby depriving the original proprietor of all reward. Thus the enterprising and talented manufacturer of integrity had less chance of success than those in the same trade, who employing no skill or taste, were willing to depend on copying the productions of others. To meet this state of things an act was passed in 1839, entitled "An Act to Secure to Proprietors of Designs for Articles of manufacture, the Copyright of such Designs for a limited time."

This statute applies to designs used in three classes of manufacture; first, for any pattern or print, to be either worked into, or worked on, or printed on, or painted on any article of manufacture, being a tissue or textile fabric, except lace, and also except linen, cotton, calicoes, muslins, and other articles within the meaning of the acts mentioned in the schedule.* The designs coming under this part of the statute are protected for twelve calendar months if the design be properly registered, and the articles made according thereto are afterwards duly marked. This portion of the statute has a very limited extent, and will chiefly apply to patterns embossed or worked on fabrics, and may be considered of very little value to the manufacturer, as the class of goods which comes within the meaning of this clause of the statute seldom require very numerous copies of the same design, but in such cases as require a number to justify the expense of registration, the designs or patterns to be used may be protected under the act.

The statute contemplates, secondly, the protection of designs or patterns, "for the modelling, or the casting, or the embossing, or the chasing, or the engraving, or for any other kind of impression or ornament, on any article of manufacture not being a tissue or textile fabric;"

* See p. 58.

and, thirdly, the act offers protection to the proprietor of any design for the shape or configuration of any article of manufacture.

These may be said to constitute the important parts of the statute, as they apply to a great variety of manufactures; and when the articles made are composed of metal, or mixtures of metal, the protection secured by the act is for three years; but when composed of any other matter or material, the protection is only for one year.

It will be desirable, before entering into a consideration of the means to be pursued by manufacturers, in order to protect any pattern or design of an article of manufacture, first to point out those designs to which this act does not extend; and these are all designs for printing linens, cottons, calicoes, and other woven fabrics, the designs for such purposes being protected for the term of three months, by the acts 34 Geo. 3, cap. XXIII., and 2 Victoria, cap. XIII.*

In order to obtain protection for a design intended for any article of manufacture, it must be registered according to the statute; and care must be observed, first, that no publication, by sale of articles produced according thereto, be made before registration; second, that, after the registration, every article manufactured according to the design, must be marked with the name of the registered proprietor and the number and date of the register. The person registering a design according to the statute may be the author, if the work has not been produced for another for a valuable consideration; in which case the person for whom the design has been produced may register as the proprietor; and any person purchasing a new design may register the same, and thus become the registered proprietor of such design. The object and intention of this act of parliament have been very much misunderstood; and it has been supposed by many that new inventions of a mechanical nature, such as weighing machines,

* For the Acts here referred to, see p. 44.

lamps, and machines of various kinds may be secured for a short period; and, in fact, that this statute offers the same protection as a patent, and for the same class of cases, excepting as to the length of time. This is entirely erroneous; for it may be broadly stated that an invention, for which a patent may be secured, can in no way be protected under the Registration Act; and, on the other hand, the invention of a design which can be protected under the Registration Act cannot be made the subject of a patent. The intention of the Registration Act is to secure to the author or to the proprietor of any new design, applicable to a manufactured article, the exclusive right in the making and selling of that article of manufacture, when made according to the configuration or contour proposed by the new design: whilst a patent secures to the inventor the exclusive right of any manner of new manufacture, whether the invention be for a new machine, or an improvement of a machine, or a new or improved process for producing known manufactures. We will suppose a case which will make the distinction most clear. In registering any new design for a table-lamp, all which could be secured under such registration would be, some peculiarity of form in the stem or oil vessel, or in the glass shade—no new mode of supplying oil to the wick, nor any new mode of raising the wick, nor any new apparatus for supplying air to support combustion, could become the subject matter of a registration. The simple configuration or contour of the lamp, or some particular part of the lamp, would be the only subject for registration; and any person might without infringing the registration make the same description of lamp, all parts acting mechanically in the same manner to produce the same end, so long as the outer configurations were not imitated. A patent, on the contrary, can scarcely ever be said to depend on shape; and supposing a patent be taken for any improved construction of lamp, such, for instance, as an improved means of raising the oil from the stem or pillar

of a table-lamp, the patent would be equally infringed, whether the external figure or design be retained or not, so long as the means of raising the oil are preserved. Pursuing this error, many persons have registered weighing as well as other machines, which have for their object peculiar modes of working, without reference to the figure or shape of the whole or of the parts. A case may be given. When the post office regulations were first made, several weighing machines were registered, amongst others were some in which the beam had a suitable scale or apparatus at one end for holding letters, the other end being provided with means of successively raising additional weights, and by the number of weights raised, the weight of the letter was indicated ; this registration could simply secure the design of the stem and beam, and weights, when all were kept of the same figure or configuration ; any other person might have made the same weighing machine, by simply changing the shape of the stem or the beam, or the weights ; thus, supposing in the registered design the fulcrum of the beam to be supported by an Ionic column, and another person were to substitute a Corinthian column, the registered machine would not be infringed, though for all practical purposes, the machine would be the same ; it will, therefore, become very clear, that inventions which depend for their value on modes of action, and not on their external figure, are not proper subjects for registration, but for patents ; and it is important that manufacturers should well understand this distinction ; for there is no recalling a registration after it is once made, the act of registration is a publication, and no valid patent could afterwards be secured. The intention of the Registration Act, is to give protection to persons who introduce new designs into the market ; and for this purpose the act is very valuable. Heretofore, a manufacturer bringing out a new pattern of stove, or fender, or coffee-pot, or urn, or lamp, or table, or candlestick, or tray, or bell-pull, or handles for doors, or new form of

button, or for a new form of decanter, or other glass vessel, &c., &c., was in no way protected ; on the contrary, a pattern of any article of manufacture which became a favourite with the public, and which ought to have produced considerable profit to the party bringing it out, quickly became copied ; and often such party, in place of profit, suffered a loss. In all such cases, the manufacturer may now protect himself by registration for a period of one year at least ; and if the manufacture be of metal, for three years. At the same time considerable care is requisite in the manner of registering a design according to the statute : in some cases the whole article may be of a new design, in other cases, only part of the article will be according to a new design ; and it will be evident, that the simple shewing of the article complete, will not for both cases be a correct registration. This may be made more clear to the reader, by again supposing the case to be a new design for the stem of a table-lamp ; in such a case, if the whole table-lamp were to be shewn and registered, without any statement of that portion to which the registration was intended to apply, the registration would in fact be for the whole lamp, stem, oil-vessel, and glass-shade, and a change of figure being given to either of the parts, would take it out of the registration ; but if the registration pointed out or specified correctly the extent of the pattern proposed to be secured, the alteration of other of the parts shewn, would not enable another person legally to use the new pattern or design of the part pointed out. Again, supposing the case to be a new design for a fender, and that the registration shewed that the fender was supported by balls, if the registration did not define that it was the front surface of the fender, without reference to the means of supporting it, which was intended to be secured by the registration ; another person placing the feet of an animal, or other device, as the supports, would not infringe the registration. In fact, it is clear, that in order to protect a new design for a manu-

facture, the nature of that design and its extent must be made clear to the public on the face of the document which is registered, in a somewhat similar manner to the specification of a patent. How, otherwise, is the public to know the precise point to which a registration lays claim, any more than if a patentee describes generally a machine or a process partly new and partly old. If the public on reading the specification fairly, cannot ascertain what is new from what is old, the patent is bad. Is it not natural then to suppose, that a person making a registration, if he mix up old matters of design with new matters of design, (and without which in many cases he cannot shew the new design correctly,) and does not point out what constitutes the new portion of design claimed under the registration, that he will be visited with a similar legal construction, and that he will lose the intended protection. The better way, in making registrations of designs under the statute, is, simply to shew by drawings, and, if necessary, to describe only so much of any article of manufacture as relates to the novel design or pattern; but where other parts, and parts which may be varied, are considered necessary to be shewn, then great care is requisite in pointing out to what extent the registration is intended to extend.

A manufacturer or other person possessed of a design which it is wished to register according to the statute will observe the following directions:—

First, the design is to be registered by presenting at the proper office three drawings of the design, one of which is filed at the office, another is placed at the disposal of the board of trade, and the third is returned to the proprietor, duly stamped and numbered, and the production of this document is *prima facie* proof for certain purposes mentioned in the act.

Second, after the registration of the design, every article of manufacture published by the proprietor, on which the design is used, must have thereon the name of the first

registered proprietor, the number of the design in the register, and the date of registration.

The copyright of a registered design may be sold and transferred at very small cost : the form will be found in the act of 2nd Victoria (p. 16).

In cases of infringement of any registered design, the proprietor may recover a penalty for every offence, of a sum of not less than £5, and not exceeding £30 : and such penalties may be recovered by action in any of the superior courts of law, or by summoning the offending party before two justices of the peace acting for the county, riding, division, city, or borough, where the offending party resides ; and such justices, on hearing the case as directed by the act, may award the damages ; but such proceedings must be brought within six months after the commission of the act complained of.

Lincoln's Inn,
November 20th, 1841.

Acts referred to in the foregoing.

27th Year of George III.

CAP. XXXVIII.—*An Act for the Encouragement of the Arts of Designing and Printing Linens, Cottons, Calicoes, and Muslins, by vesting the Properties thereof in the Designers, Printers, and Proprietors, for a limited Time.*

Whereas it may be expedient, for the encouragement of the arts of designing original patterns for printing linens, calicoes, cottons, and muslins, to vest the property thereof in the designers, printers, or proprietors, for a limited time ; for which purpose, may it please your majesty, that it may be enacted ; and be it enacted by the King's most excellent majesty, by and with the advice and consent of the lords spiritual and temporal, and commons, in this present parliament assembled, and by the authority of the same, that, from and after the 1st of June, 1787,

every person who shall invent, design, and print, or cause to be invented, designed, and printed, and become the proprietor of any new and original pattern or patterns for printing linens, cottons, calicoes, or muslins, shall have the sole right and liberty of printing and reprinting the same for the term of two months, to commence from the day of the first publishing thereof, which shall be truly printed, with the name of the printer or proprietors at each end of every such piece of linen, cotton, calicoe, or muslin; and that if any calicoe printer, linen draper, or other person whatsoever, from and after the 1st of June, 1767, within the time limited by this act, shall print, work, or copy, such original pattern or patterns, or cause to be printed, worked, or copied, such original pattern or patterns, or shall print or reprint, or cause to be printed or reprinted, any such pattern or patterns, and shall publish, sell, or expose to sale, or in any other manner dispose of, or cause to be published, sold, or exposed to sale, or in any other manner disposed of, any linen, cotton, calicoe, or muslin, so printed without the consent of the proprietor or proprietors thereof, first had and obtained in writing, signed by him or them respectively, in the presence of two or more credible witnesses, knowing the same to be so printed or reprinted without the consent of the proprietor or proprietors of such pattern, then every such proprietor or proprietors of such pattern shall and may, if the offence be committed in England, by and in a special action upon the case, to be brought against the person or persons so offending, recover such damages as a jury on the trial of such action, or on the execution of a writ of inquiry thereon, shall give or assess, together with costs of suit, in which no wager of law, essoign, privilege, or protection, or more than one imparlance, shall be allowed; and if the offence be committed in Scotland, every such proprietor or proprietors shall and may, by an action to be brought before the court of session, or any judge com-

petent to try civil causes within his bounds, recover such damages as the said court of session, or the said judge, shall give or assess, and for payment whereof decree shall be issued with full costs of suit, on which all such execution shall pass as is competent by the laws and practice of Scotland in the like cases : Provided nevertheless, that it shall and may be lawful for any person or persons who shall hereafter purchase any plate or plates, block or blocks, for printing, from the original proprietors thereof, to print, reprint, and expose for sale, or cause to be printed, reprinted, and exposed for sale, from the said plates or blocks, without being liable to any action on that account.

II. And be it further enacted by the authority aforesaid, that if any action or suit shall be commenced or brought against any person or persons whatsoever, for any offence committed against this act, the same shall be brought within the space of six months after so doing, and the defendant and defendants, in such action or suit, if brought in England, shall and may plead the general issue, and give the special matter in evidence, and if, upon such action or suit, a verdict shall be given for the defendant or defendants, or if the plaintiff or plaintiffs become nonsuited, or discontinue his, her, or their action or actions, then the defendant or defendants shall have and receive full costs, for the recovery whereof he shall have the same remedy as any other defendant or defendants in any other case hath or have by law ; and if such action be brought in Scotland and not insisted in, or if the defender be assolizied, then the defender shall be intitled to full costs, for the recovery whereof he shall have the same remedy as herein-before is given to the pursuer.

III. And be it further enacted by the authority aforesaid, that this act shall continue in force for one year, and from thence to the end of the then next session of parliament ; and shall be deemed, adjudged, and taken to be a publick act, and be judicially taken notice of as such

by all judges, justices, and other persons whatsoever, without specially pleading the same.

29th George III.

CAP. XIX.—*An Act for continuing an Act, made in the 27th Year of the Reign of his present Majesty, intituled, “An Act for the Encouragement of the Arts of Designing and Printing Linens, Cottons, Calicoes, and Muslins, by vesting the Properties thereof in the Designers, Printers, and Proprietors, for a limited Time.”*

Whereas an act was made in the twenty-seventh year of the reign of his present majesty, (intituled, “An Act for the Encouragement of the Arts of Designing and Printing Linens, Cottons, Calicoes, and Muslins, by vesting the Properties thereof in the Designers, Printers, and Proprietors, for a limited Time”) : and whereas the said act hath, by experience, been found to be useful and beneficial, and is near expiring ; may it, therefore, please your majesty that it may be enacted ; and be it enacted by the king’s most excellent majesty, by and with the advice and consent of the lords spiritual and temporal, and commons, in this present parliament assembled, and by the authority of the same, that the said recited act, and all the clauses, matters, and things therein contained, shall be, and the same is hereby continued from the expiration thereof, until the first of July, 1794.

34th George III.

CAP. XXIII. *An Act for amending and making perpetual an Act made in the 27th Year of the Reign of His present Majesty, intituled, “An Act for the Encouragement of the Arts of Designing and Printing Linens, Cottons, Calicoes, and Muslins, by vesting the Properties thereof in the Designers, Printers, and Proprietors, for a limited Time.”* [4th April, 1794.]

Whereas an act was made in the 27th year of the

reign of his present majesty, (intituled, “An Act for the Encouragement of the Arts of Designing and Printing Linens, Cottons, Calicoes, and Muslins, by vesting the Properties thereof in the Designers, Printers, and Proprietors, for a Limited Time”) ; which said act was, by another act made in the 29th year of the reign of his present majesty, continued from the expiration thereof, until the 1st of July, 1794: and whereas the said first recited act hath by experience been found to be useful and beneficial: and whereas it is expedient that the time limited by the said first recited act for vesting the property of new and original patterns for printing linens, cottons, calicoes, or muslins, in the designers, printers, and proprietors thereof, should be extended for a longer time: may it please your majesty that it may be enacted; and be it enacted by the king’s most excellent majesty, by and with the advice and consent of the lords spiritual and temporal, and commons, in this present parliament assembled, and by the authority of the same, that, from and after the 1st of July, 1794, every person who shall invent, design, and print, or cause to be invented, designed and printed, and become the proprietor of any new and original pattern or patterns for printing linens, cottons, calicoes, or muslins, shall have the sole right and liberty of printing and reprinting the same for the term of three months, to commence from the day of the first publishing thereof, which shall be truly printed with the name of the printer or proprietors at each end of every such piece of linen, cotton, calico, or muslin; and that if any calico printer, linen draper, or other person whatsoever, from and after the said 1st of July, 1794, within the time limited by this act, shall print, work, or copy, such original pattern or patterns, or cause to be printed, worked, or copied, such original pattern or patterns, or shall print or reprint, or cause to be printed or reprinted, any such pattern or patterns, and shall publish, sell, or expose to sale, or in any other manner dispose of, or cause to be published,

sold, or exposed to sale, or in any other manner disposed of, any linen, cotton, calico, or muslin, so printed, without the consent of the proprietor or proprietors thereof, first had and obtained in writing, signed by him or them respectively in the presence of two or more credible witnesses), knowing the same to be so printed or reprinted without the consent of the proprietor or proprietors of such pattern, then every such proprietor or proprietors shall and may, if the offence be committed in England, by and in a special action upon the case, to be brought against the person or persons so offending, to recover such damages as a jury on the trial of such action, or on the execution of a writ of inquiry thereon, shall give or assess, together with costs of suit, in which no wager of law, essoin, privilege, or protection, or more than one imparlance, shall be allowed : and that in all other respects the said first recited act, and all the clauses, matters, and things therein contained, (except so far as the same is varied by this act), shall be, and the same is hereby made perpetual.

2nd Victoria.

CAP. XIII.—*An Act extending the Copyright of Designs for Calico Printing to Designs for Printing other Woven Fabrics.* [4th June, 1839.]

Whereas by an act passed in the 27th year of the reign of his late majesty King George the Third, intituled “An Act for the Encouragement of the Arts of Designing and Printing Linens, Calicoes, and Muslins, by vesting the Properties thereof in the Designers, Printers, and Proprietors for a limited Time;” and by another act made in the 34th year of the same reign, for amending and making perpetual the said act, it was enacted, that every person who should invent, design, and print, or cause to be invented, designed, and printed, and become the proprietor of any new and original pattern or patterns, for printing linens, cottons, calicoes, or muslins, should have the sole

right and liberty of printing and reprinting the same for the term of three months : and whereas it is expedient to extend the said acts to Ireland : and whereas since the passing of the last-recited act, there have been invented other fabrics of a similar nature, to which the said copy-right doth not extend ; be it enacted by the Queen's most excellent majesty, by and with the advice and consent of the lords spiritual and temporal, and commons, in this present parliament assembled, and by the authority of the same, that this act shall come into operation on the passing thereof.

II. And be it enacted, that the said recited acts and this act shall extend to Ireland, as well as to England and Scotland.

III. And be it enacted, that the provisions of the said recited acts shall extend to the following woven fabrics, published after the passing of this act (that is to say) :—

To fabrics composed of wool, silk, or hair :

To mixed fabrics, composed of any two or more of the following materials ; (that is to say,) linen, cotton wool, silk, or hair.

IV. And with regard to any fabrics to which the recited acts and this act extend, which shall be published after the passing of this act, be it enacted, that the recited act and this act shall be construed as one act.

V. And be it enacted, that if any offence either against the recited acts or against this act be committed in Ireland, the party aggrieved shall have the same remedies in the supreme courts of law in Dublin, which in the like case the same party would have in England.

2nd Victoria.

CAP. XVII.—*An Act to secure to Proprietors of Designs for Articles of Manufacture, the Copyright of such Designs for a limited Time.* [14th June, 1839.]

Whereas it is expedient that provision should be made for securing the exclusive benefit of designs for articles of

manufacture to the authors and proprietors thereof, for a limited time ; be it therefore enacted by the Queen's most excellent majesty, by and with the advice and consent of the lords spiritual and temporal, and commons, in this present parliament assembled, and by the authority of the same, that every proprietor of a new and original design made for any of the following purposes, and not published before the 1st of July, 1839, shall have the sole right to use the same for any such purpose, during the term of twelve calendar months, to be computed from the time of the same being registered according to this act ; and the following are the purposes referred to :

First.—For the pattern or print, to be either worked into, or worked on, or printed on, or painted on, any article of manufacture, being a tissue or textile fabric, except lace, and also except linens, cottons, calicoes, muslins, and any other article within the meaning of the acts mentioned in the schedule hereto annexed :

Second.—For the modelling, or the casting, or the embossment, or the chasing, or the engraving, or for any other kind of impression or ornament on any article of manufacture, not being a tissue or textile fabric :

Third.—For the shape or configuration of any article of manufacture, except lace, and also except linens, cottons, calicoes, muslins, and any other article within the meaning of the acts mentioned in the schedule hereto annexed.

Provided always, that every proprietor of a new and original design made for the modelling, or the casting, or the embossment, or the chasing, or the engraving, or for any other kind of impression or ornament on any article of manufacture, being of any metal or mixed metals, shall have the sole right to use the same during the term of three years, to be computed from the time of the same being registered according to this act ; but no person

shall be entitled to the benefit of this act unless the design have before publication been registered according to this act, and unless such person be registered according to this act as the proprietor of the design, and unless after publication of the design, every article of manufacture published by him, on which such design is used, have thereon the name of the first registered proprietor, and the number of the design in the register, and the date of the registration thereof: And the author of every such new and original design shall be considered the proprietor, unless he have executed the work on behalf of another person for a valuable consideration, in which case such person shall be considered the proprietor, and shall be entitled to be registered in the place of the author, and every person purchasing for a valuable consideration a new and original design, or the exclusive or the partial right to use the same for any one or more of the above-mentioned purposes, in relation to any one or more articles of manufacture, shall be considered as the proprietor of the design for all or any one or more of such purposes, as the case happens to be.

II. And be it enacted, that every person purchasing a new and original design, may enter his title in the register hereby provided; and any writing purporting to be a transfer of such design, and signed by the proprietor thereof, shall operate as an effectual transfer; and the registrar shall, on request, and the production of such writing, insert the name of the new proprietor in the register; and the following may be the form of such transfer, and of such request to the registrar:

Form of Transfer and Authority to Register.

“I, *A. B.*, author [*or proprietor*] of design number _____ having transferred my right thereto [*or if such transfer be partial*] so far as regards the making of _____ [*describe the articles of manufacture with respect to which the right is transferred*] to *B. C.* of _____

do hereby authorize you to insert his name on the register of designs accordingly."

Form of Request to Register.

"I, *B. C.*, the person mentioned in the above transfer, do request you to register my name and property in the said design, according to the terms of such transfer."

III. And be it enacted, that during the existence of such exclusive or partial right, no person shall either do or cause to be done any of the following acts in regard to a registered design, without the licence or consent in writing of the registered proprietor thereof; (that is to say,)

No person shall use for the purposes aforesaid, or any of them, or print, or work, or copy, such registered design, or any original part thereof, on any article of manufacture, for sale :

No person shall publish, or sell, or expose to sale, or barter, or in any other manner dispose of for profit any article whereon such registered design or any original part thereof has been used, knowing that the proprietor of such design has not given his consent to the use thereof upon such article :

No person shall adopt any such registered design on any article of manufacture for sale, either wholly or partially, by making any addition to any original part thereof, or by making any subtraction from any original part thereof :

And if any person commit any such act, he shall for every offence forfeit a sum not less than five pounds and not exceeding thirty pounds, to the proprietor of the design, in respect of which such offence has been committed.

IV. And be it enacted, that the party injured by any such act, may recover such penalty as follows :

In *England*, either by an action of debt, or on the case against the party offending, or by summary proceeding before two justices having jurisdiction where the offending party resides ; and if the party injured

proceed by such summary proceeding, any justice of the peace acting for the county, riding, division, city, or borough, where the party offending resides, and not being concerned either in the sale or manufacture of the article of manufacture, or in the design to which such summary proceeding relates, may issue a summons requiring such party to appear on a day, and at a time and place to be named in such summons, such time not being less than eight days from the date thereof ; and every such summons shall be served on the party offending, either in person or at his usual place of abode ; and either upon the appearance or upon the default to appear of the party offending, any two or more of such justices may proceed to the hearing of the complaint, and upon proof of the offence, either by the confession of the party offending, or upon the oath or affirmation of one or more credible witnesses, which such justices are hereby authorized to administer, may convict the offender in a penalty of not less than five pounds or more than thirty pounds, as aforesaid, for each offence, as to such justices doth seem fit ; and if the amount of such penalty or of such penalties, and the costs attending the conviction, so assessed by such justices, be not forthwith paid, the amount of the penalty or of the penalties, and of the costs, together with the costs of the distress and sale, shall be levied by distress and sale of the goods and chattels of the offender, wherever the same happen to be in *England* ; and the justices before whom the party has been convicted, or, on proof of the conviction, any two justices acting for any county, riding, division, city, or borough in *England*, where goods and chattels of the person offending happen to be, may grant a warrant for such distress and sale ; and the overplus, if any, shall be returned to the owner of the goods and chattels, on demand :

In *Scotland*, either before the court of session, or by

summary proceeding as aforesaid before any two or more justices of the peace, of the county or place where the offence was committed :

In *Ireland*, either by action in a superior court of law, at *Dublin*, or by civil bill in the civil bill court of the county or place where the offence was committed :

And no action or other proceeding for any offence under this act shall be brought after the expiration of six calendar months from the commission of the offence ; and in such action or other proceeding every plaintiff or prosecutor shall recover his full costs of suit, or of such other proceeding.

V. For the purpose of registering designs for articles of manufacture, in order to obtain the protection of this act, be it enacted, that the lords of the committee of privy council for the consideration of all matters of trade and plantations may appoint a person to be a registrar of designs for articles of manufacture, and if the lords of the said committee see fit, a deputy registrar, clerks, and other necessary officers and servants ; and such registrar and deputy registrar shall hold their offices during the pleasure of the lords of the said committee ; and the commissioners of the treasury may from time to time fix the salary or remuneration of such registrar, deputy registrar, clerks, officers, and servants ; and, subject to the provisions of this act, the lords of the said committee may make rules for regulating the execution of the duties of the office of the said registrar ; and such registrar shall have a seal of office.

VI. And be it enacted, that the said registrar shall not register any design unless he be furnished with three copies or drawings of such design, accompanied with the name and place of abode of the proprietor thereof ; and the registrar shall register all such copies from time to time successively, as they are received by him for that purpose, and on every such copy he shall affix a number corresponding to such succession, and he shall retain two copies,

one of which he shall file in his office, and the other he shall hold at the disposition of the lords of the said committee, and the remaining copy he shall return to the person by whom the same has been forwarded to him; and in order to give ready access to the copies of designs so registered, he shall keep a classified index of such copies of designs.

VII. And be it enacted, that upon any original design so registered, and upon every copy thereof received for the purpose of being registered, or for the purpose of such registration being certified thereon, the registrar shall certify under his hand that the design has been so registered, the date of such registration, and the name of the registered proprietor; and such certificate made on every such original design, or on such copy thereof, and purporting to be signed by the registrar or deputy registrar, and purporting to have the seal of office of such registrar affixed thereto, shall, in the absence of evidence to the contrary, be sufficient proof as follows:—

Of the design, and of the name of the proprietor therein mentioned, having been duly registered; and

Of the commencement of the period of registry; and

Of the person named therein as proprietor being the proprietor; and

Of the originality of the design; and

Of the provisions of this act, and of any rule under which the certificate appears to be made, having been complied with:

And any such writing purporting to be such certificate, shall (in the absence of evidence to the contrary), be received in evidence without proof of the handwriting of the signature thereto, or of the seal of office affixed thereto, or of the person signing the same being the registrar or deputy registrar.

VIII. And be it enacted, that the commissioners of the treasury shall from time to time fix the fees to be paid

for the services to be performed by the registrar, and such fees shall be applied to defray the expences of the said office, and the salaries or other remuneration of the said registrar, and of any other persons employed under him, with the sanction of the commissioners of the treasury, in the execution of this act, and the balance shall be carried to the consolidated fund of the united kingdom, and be paid accordingly into the receipt of her majesty's exchequer at Westminster; and the commissioners of the treasury may regulate the manner in which such fees are to be received, and in which they are to be kept, and in which they are to be accounted for.

IX. And be it enacted, that if either the registrar or any person employed under him, either demand or receive any gratuity or reward, whether in money or otherwise, except the salary or remuneration authorized by the commissioners of the treasury, he shall forfeit for every such offence fifty pounds, to any person suing for the same by action of debt in the court of exchequer at Westminster, and he shall also be liable to be either suspended or dismissed from his office, and rendered incapable of holding any situation in the said office, as the lords of the treasury see fit.

X. And for the purpose of facilitating the use of the provisions of this act in regard to the registration of designs, be it enacted, that all letters and packets transmitted by the post, either to or from the office of registrar of designs, relating solely to the business of such office, shall be exempt from postage; and that in respect to such letters and packets the provisions of an act passed in the first year of her present majesty's reign, intituled an act for regulating the sending and receiving of letters and packets by the post, free from the duty of postage, relating to the general regulation of the official privileges of franking, and to the transmission to the post office of unprivileged letters, and the penalties and provisions mentioned in an act passed in the first year of the reign

of her present majesty, intituled "An Act for Consolidating the Laws relative to Offences against the Post Office of the United Kingdom, and for Regulating the Judicial Administration of the Post Office Laws, and for Explaining certain Terms and Expressions employed in those Laws," shall, so far as the same may be applicable, apply to the office of the registrar of designs, and the franking officer thereof.

XI. And, for the interpretation of this act, be it enacted, that the following terms and expressions, so far as they are not repugnant to the context of this act, shall be construed as follows ; (that is to say,) the expression "commissioners of the treasury" shall mean the lord high treasurer for the time being, or the commissioners of her majesty's treasury for the time being, or any three or more of them ; and the expression "article of manufacture" shall include any article of the kind herein referred to, whether it be made by hand or by machinery, or by both of those means ; and the singular number shall include the plural as well as the singular number ; and the masculine gender shall include the feminine gender as well as the masculine gender.

XII. And be it enacted, that this act shall come into operation on the passing thereof, as to the office and the appointment of the registrar hereby authorized, and on the 1st of July, 1839, as to the other parts of the act.

XIII. And be it enacted, that this act may be amended or repealed by any act to be passed in the present session of parliament.

Schedule.

DATE OF ACTS.

TITLE.

<p>27 Geo. 3. c. 38. (1787.)</p> <p style="text-align: center;">*</p>	<p>An act for the encouragement of the arts of designing and printing linens, cottons, calicoes, and muslins, by vesting the properties thereof in the designers, printers, and proprietors for a limited time.</p>
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- 29 Geo. 3. c. 19. (1789.) An act for continuing an act for the encouragement of the arts of designing and printing linens, cottons, calicoes, and muslins, by vesting the properties thereof in the designers, printers, and proprietors, for a limited time.
- 34 Geo. 3. c. 23. (1794.) An act for amending and making perpetual an act for the encouragement of the arts of designing and printing linens, cottons, calicoes, and muslins, by vesting the properties thereof in the designers, printers, and proprietors, for a limited time.
- 2 Vict. (1839.) An act passed during the present session of parliament, "for extending the copyright of designs for calico printing to designs for printing other woven fabrics."

LIST OF NEW PATENTS.

ROBERT WILSON, of Sowerby Bridge, Halifax, Currier and Tanner, for improvements in the manufacture of leather.—Sealed December 2, 1841.—(*Six months.*)

WILLIAM IRVING, of Princes Street, Rotherhithe, Gentleman, for improvements in the manufacture of bricks and tiles.—Sealed December 7, 1841.—(*Six months.*)

JAMES COLMAN, of Stoke Holy Cross, Norfolk, Starch Manufacturer, for improvements in the manufacture of starch.—Sealed December 9, 1841.—(*Six months.*)

WILLIAM HENRY FOX TALBOT, of Lacock Abbey, Wilts, Esquire, for improvements in coating or covering metals with other metals, and in colouring metallic surfaces.—Sealed December 9, 1841.—(*Six months.*)

JOHN HALL, of Breezes Hill, Ratcliff Highway, Sugar Refiner, for improvements in the construction of boilers for generating steam, and in the application of steam to mechanical power.—Sealed December 9, 1841.—(*Six months.*)

ARCHIBALD TEMPLETON, of Lancaster, Silk Spinner, for a new or improved method of preparing for spinning silk and other fibrous substances.—Sealed December 9, 1841.—(*Six months.*)

JONATHAN GUY DASHWOOD, of Ryde, Isle of Wight, Plumber, for improvements in the construction of cocks and taps.—Sealed December 9, 1841.—(*Six months.*)

MOSES POOLE, of Lincoln's Inn, Gentleman, for improvements in the construction of masts for ships and vessels, and in applying the shrouds. Communicated by a foreigner residing abroad.—Sealed December 9, 1841.—(*Six months.*)

JOSIAH TAYLOR, of Birmingham, Brass Founder, for improvements in the construction of lamps.—Sealed December 9, 1841.—(*Six months.*)

ROBERT HENDERSON, of Birmingham, China Dealer and Glass Stainer, for certain improvements in apparatus for heating and lighting apartments, and for other like purposes.—Sealed December 9, 1841.—(*Six months.*)

HENRY WILKINSON, of Pall Mall, Gun Maker, for improvements in machinery to be used in constructing buildings and in raising and lowering weights and materials Communicated by a foreigner residing abroad.—Sealed December 9, 1841.—(*Six months.*)

JOHN EDWARDS, of Shoreditch, Warehouseman, for improvements in giving signals on railways.—Sealed December 9, 1841.—(*Six months.*)

WILLIAM GEORGE HENRY TAUNTON, of Liverpool, Engineer, for improvements in machinery for raising weights.—Sealed December 9, 1841.—(*Six months.*)

WILLIAM WESTLEY RICHARDS, of Birmingham, Gun Maker, for improvements in the construction of gun and

pistol-locks and primers for the discharge of fire-arms.
—Sealed December 14, 1841.—(*Six months.*)

WILLIAM EDWARD NEWTON, of Chancery Lane, Civil Engineer, for certain improvements in printing or delineating patterns and printed cloths for floor-cloths, covers, and other uses. Communicated by a foreigner residing abroad.—Sealed December 9, 1841. — (*Six months.*)

FRANCIS MARX, of 81, Eaton Square, Esquire, for certain improvements in the construction of ships or other vessels, and the method of propelling them. Communicated by a foreigner residing abroad—Sealed December 16, 1841.—(*Six months.*)

WILLIAM NEILSON, Builder, DAVID LYON, Builder, and PETER M'ONIE, Engineer, all of Glasgow, for a mode or modes of, or an improvement or improvements in, cutting, dressing, preparing, and polishing stones, marble, and other substances, and also in forming flat or round mouldings and other figures thereon.—Sealed December 16, 1841.—(*Six months.*)

CHARLES EDWARD AUSTIN, of Fulham, Engineer, for an apparatus for what is commonly called changing the line on railways.—Sealed December 16, 1841.—(*Six months.*)

JAMES STEWART, of Osnaburgh Street, Regent's Park, Piano Forte Maker, for an improvement in the construction of casters.—Sealed December 16, 1841.—(*Six months.*)

WILLIAM PROWETT, of Northamptonshire, Victualler, for improvements in giving signals on railways.—Sealed December 16, 1841.—(*Six months.*)

HENRY BOOTH, of Liverpool, Esquire, for improvements in the method of propelling vessels through water.—Sealed December 16, 1841.—(*Six months.*)

JOHN NORTON, of the Junior United Service* Club, Regent Street, Esquire, for improvements in sheathing ships and other vessels.—Sealed December 16, 1841.—(*Six months.*)

ANTOINE MERTENS, of the London Coffee House, Publisher, for improvements in the manufacture of plaited fabrics.—Sealed December 16, 1841.—(*Six months.*)

WILLIAM CHURCH, of Birmingham, Civil Engineer, and JONATHAN HARLOW, of the same place, Manufacturer, for certain improvements in the mode of manufacturing metallic tubes, and in the mode of joining them, or other tubes or pieces for various useful purposes.—Sealed December 16, 1841.—(*Six months.*)

THOMAS STARKEY, of Birmingham, Copper Cap Manufacturer, for improvements in percussion caps for discharging fire-arms.—Sealed December 16, 1841.—(*Six months.*)

JOHN AMERICUS FANSHAW, of Hatfield Street, Christ Church, Gentleman, for an improved manufacture of waterproof fabric, applicable to the purposes of covering and packing bodies, buildings, and goods exposed to water and damp.—Sealed December 16, 1841.—(*Six months.*)

WILLIAM BUCKWELL, of Trinity Street, Borough, Civil Engineer, for improvements in scaffolding or framework for building purposes.—Sealed December 16, 1841.—(*Six months.*)

CHARLES LOOSEY, of Half Moon Street, Piccadilly, Civil Engineer, for improvements in steam-engines, and which improvements are also applicable in raising or forcing water and propelling vessels.—Sealed December 16, 1841.—(*Six months.*)

JOHN BOULD, of Ovenden, Halifax, Cotton Spinner, for an improvement or improvements in condensing steam-engines.—Sealed December 16, 1841.—(*Six months.*)

ANTOINE JEAN FRANCOIS CLAUDET, of High Holborn, Glass Merchant, for certain improvements in the process or means of, and apparatus for, obtaining images or representations of nature or art.—Sealed December 18, 1841.—(*Six months.*)

HENRY HOUGH WATSON, of Bolton-le-Moors, Lancas-

ter, Consulting Chemist, for certain improvements in dressing, stiffening, and finishing cotton and other fibrous substances, and textile and other fabrics, part or parts of which improvements are applicable to the manufacture of paper, and also to some of the processes or operations connected with printing calicoes and other goods.—Sealed December 21, 1841.—(*Six months.*)

WILLIAM EDWARD NEWTON, of Chancery Lane, Civil Engineer, for certain improvements in lamps and burners, and in the means of supplying air and heat thereto for the support of combustion. Communicated by a foreigner residing abroad.—Sealed December 21, 1841.—(*Six months.*)

WILLIAM NEWTON, of Chancery Lane, Civil Engineer, for certain improvements in cleansing wool and facilitating the operation of dyeing, and also in washing and bleaching cotton, yarn, or fabrics. Communicated by a foreigner residing abroad.—Sealed December 21, 1841.—(*Six months.*)

OVID TOPHAM, of White Cross Street, Engineer, for improvements in engines, machines, apparatus, or means for extinguishing or stopping the progress of fire in any room or part of different buildings which may have become ignited, such as noblemen or gentlemen's mansions, houses, factories, store and warehouses, and consequently preserving them from destruction and preventing the loss of life.—Sealed December 21, 1841.—(*Six months.*)

GEORGE PALMER HENRY, of Peckham, Chemist, for improvements in apparatus to be applied to the glass-chimneys of gas-burners.—Sealed December 21, 1841.—(*Six months.*)

JOHN COX, of Gongie Mills, Edinburgh, Tanner and Glue Maker, for certain improved processes of tanning.—Sealed December 21, 1841.—(*Six months.*)

JOHN OLIVER YORK, of Upper Colleshill Street, Eaton Square, Engineer, for improvements in the construction of railway axles and wheels.—Sealed December 21, 1841.—(*Six months.*)

WILLIAM CARRON, of Birmingham, Lathe Maker, for improvements in the construction of clogs and pattens.—Sealed December 21, 1841.—(*Six months.*)

WILLIAM HENRY SMITH, of Finsbury Chambers, Bloomfield Street, Civil Engineer, for certain improvements in the construction and manufacture of connectors or fastenings, applicable to garments and other uses.—Sealed December 21, 1841.—(*Six months.*)

ADOLPHE FOURMENT, of Museum Street, Engineer, for improvements in castors for cabinet furniture and other purposes.—Sealed December 21, 1841.—(*Six months.*)

THOMAS WRIGHT, of Church Lane, Chelsea, Lieutenant in the Royal Navy, and **ALEXANDER BAIN**, of Percival Street, Clerkenwell, Mechanist, for improvements in applying electricity to controul railway engines and carriages, to mark time, to give signals and print intelligence at distant places.—Sealed December 21, 1841.—(*Six months.*)

HENRY ALPHONSE BONNEVIALLE BOUVEIRON, of Trevor Square, Merchant, for improvements in axle-trees.—Sealed December 21, 1841.—(*Six months.*)

WILLIAM BURGE, of Bristol, Sign Painter, for improvements in propelling vessels.—Sealed December 21, 1841.—(*Six months.*)

WILLIAM CARR THORNTON, of Cleckheaton, Machine Maker, for certain improvements in machinery or apparatus for making cards, for carding cotton, and other fibrous substances.—Sealed December 21, 1841.—(*Six months.*)

JOHN WATSON, of Chorley, Lancaster, Gentleman, for improvements in the construction of filters used in the manufacture of sugar.—Sealed December 23, 1841.—(*Six months.*)

WILLIAM BAILLIEU, of Gloucester Street, Queen Square, Bloomsbury, Musician, for improvements in apparatus to expand the human chest.—Sealed December 23, 1841.—(*Six months.*)

THE
REPERTORY^{Des}
OF
PATENT INVENTIONS.

No. XCVIII. NEW SERIES.—FEBRUARY, 1842.

Specification of the Patent granted to THOMAS KNOWLES, of Manchester, in the County of Lancaster, Cotton Spinner, for certain Improvements in Machinery or Apparatus used in the Preparation of Cotton and other Fibrous Substances.—Sealed August 1, 1839.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My improvements in machinery or apparatus used in the preparation of cotton and other fibrous substances, consist, firstly, in the application of a certain novel arrangement of mechanism to carding, drawing, and roving machinery used or employed in the preparation of cotton and other fibrous substances for spinning; and, secondly, in the application of a single twisting-tube or guide to drawing and roving frames, and used also in combination with my aforesaid improvements, for the purpose of imparting sufficient tenacity to the sliver before rounding it upon a bobbin, to enable it to be unwound, without injury, in the subsequent process. The principal feature of novelty in the first part of my improvements is effected by passing the sliver, as it proceeds from the doffing end of the carding engine, along and around a moveable expanding-guider, which prevents any unequal tension or stretch-

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ing of the sliver, as it is conducted to the bobbin at whatever part of the bobbin the sliver may be winding on. But in order that these improvements may be better understood, and the mode of bringing them into practical operation further explained, I have attached to these presents a sheet of drawings which sufficiently illustrate their application, and I have marked the same with figures and letters of reference, in which similar letters are placed upon corresponding parts of the mechanism in all the figures.

Description of the Drawing.

Fig. 1, is a front view ; and,

Fig. 2, a side elevation, representing the first part of my improvements as attached or applied to a carding-engine for carding cotton.

Fig. 3, is a plan, or horizontal view as seen from above ; and,

Fig. 4, is a vertical section taken through the same.

And it will be observed, that the improvements are only applicable to those machines in which the filaments, slivers, or slubbings of cotton, &c., are wound upon bobbins, instead of being placed in cans. Part of the cast-iron framing of an ordinary carding-engine is shewn at *a*, *a*, which is the doffing end ; and *b*, is the filament of cotton proceeding through the trumpet or cone, *c*, to the ordinary drawing-box, *d*, *d* ; from thence the cotton proceeds in a band or sliver along the jointed guider, *d'*, *d'*, and around the central projection-pan, *e*, which is placed at the middle of the guider upon an ordinary swivel or rule-joint. The sliver of cotton thus proceeds through the guide, *f*, *f*, and under the pressing-rollers, *g*, *g*, whence it is coiled or wound upon the bobbin, *h*, *h*, as it revolves upon the drum, *i*, *i* ; motion may be given to my improved combination of machinery from any convenient part of the carding-engine or other machine to which it is applicable. I effect this in the carding-engine as follows, namely :—The shaft, *l*, being part of the carding-engine,

which is used for giving motion to the drawing-rollers, a small pulley, *m*, is fixed upon it, and a strap being passed round this pulley, and a larger pulley, *n*, fixed on the axis of the drum or bed-roller, *i, i*, this drum is caused to revolve, and, by friction of contact, enables the bobbin to wind on the sliver. At the same time, by means of the mitre-wheels, *o, o*, and shaft, *v*, motion is communicated to the mangle-pinion, *p*, and mangle-rack, *q*, in order to traverse the guide or arm, *f*, which is fastened to the rack, *q*¹, from end to end of the bobbin, as the bobbin winds up the sliver. It must be here observed, that as the bobbin winds up each succeeding layer, its diameter increases, and consequently its speed decreases, and the guide or arm, *f*, always traversing at the same speed, the coils of the sliver, which, in the first layer, are wound upon the bobbin side by side, are in each succeeding layer wound on further and further apart, and make a smaller and smaller portion of a whole revolution straight round the bobbin at each extremity of the traverse. It must also be observed, that the traverse of the arm or guide, *f*, is made about an inch shorter at each end than the distance between the bobbin-heads; and as the diameter of the bobbin increases by the continuous winding on of the sliver, the first or under layers will expand by the pressure of the upper layers. By these arrangements the bobbin may be filled to twice the size of the bobbin-heads, and the mass of sliver which is above the bobbin-heads, will have conical ends, without the use of any other shortening motion whatever, and the coils will not slip off at the ends. I thus attain the desirable object of making a large roll of sliver without incurring the great expense of large bobbin-heads. I shall now proceed to shew the use of the expanding-guider, *d*¹, *d*¹. The distance from the unvarying point where the sliver is delivered from the carding-engine to the varying points on the bobbin, where it is wound up, gradually increases as the point of winding up becomes further from the middle of the bobbin nearer its

ends. The sliver, therefore, having to extend through this increasing distance, would manifestly be stretched more and more as the distance increased, unless it were allowed to be inconveniently slack when the distance is short. The expanding-guider, d^1 , d^1 , is applied to remedy this slackness or stretching. One of its ends is fixed on a pivot, y , (as will be seen by the drawings,) just under the point at which the sliver is delivered; the other end is fixed upon a pivot at the guiding end of the guide or arm, f , and about the middle it has a rule-joint, at which is fixed a pin, e . The expanding-guider, d^1 , d^1 , thus reaches across the varying distance, and, by means of its pivots and joint, where that distance is short, it is considerably bent, and as that distance increases, it is gradually straightened. By means of the pin, e , the sliver is made to follow the direction of the expanding-guider, and when the distance is short, the otherwise inconvenient slackness of the sliver is taken away by its bent form, and as the distance increases, its straightening prevents any stretching of the sliver.

Fig. 5, represents the front; and,

Fig. 6, a side view of my improvements, as applied to a drawing machine, a , a , being the framing of the apparatus, b , the sliver of cotton proceeding through the trumpet or cone, c , to the front or delivering-rollers, d , d , from thence the sliver proceeds, exactly as above described, along the jointed-guider, d^1 , d^1 , and around its central projecting-pin, e . It will be seen in this apparatus that this expanding-guider is placed vertically, instead of horizontally, as in the one previously described. The reciprocating twisting motion may be applied in many ways, but it is shewn in the drawing as communicated by the crank or eccentric, p , fixed on the end of the shaft, l , working the twisting cord or band, q , q , backwards and forwards, which cord, having its ends fastened to two convenient parts of the framing, passes round the twisting-tube, w , and gives to it a similar motion. r , r , are

guide-pulleys to guide the band, *q*, to and from the tube, one of them being fixed on the bow-spring, *s*, which gives elasticity to the band. *t, t*, is a small inclined plane, for the purpose of throwing off the sliver any oil that may escape from the twisting-tube in working. It is necessary to have the aperture in the upper part of the twisting-tube oblong, so that the sliver will not slip round within it. A very important feature in this my new combination of machinery, is, that it is applicable to the drawing-frames now in use, without any alteration or derangement of their parts, except such as are shewn above. From the expanding-guider, *d', d'*, the sliver proceeds through the tube, *w*, fixed in the guide or arm, *f*, and under the pressing-roller, *g*, whence it is wound upon the bobbin, *h*, revolving upon the drum, *i, i*, as in the carding-engine; the only important difference between the apparatus as applied to a carding-engine and the other machines, being the addition in the latter of the tube, *w*, through which the sliver is passed, to give it sufficient tenacity to be unwound from the bobbin in the subsequent process without injury. I give motion to my new combination of machinery in the drawing-frame as follows, namely:—A small pulley, *m*, being fixed upon the shaft, *l*, which is a part of the drawing-frame now in use, and a strap being passed round the pulley, and a larger pulley, *n*, on the axis of the drum, *i, i*, the traverse and winding up of the sliver are effected, as above described, in the carding-engine. The tube, *w*, may have motion given to it, so as to make it twist the sliver either one way only, or first one way and then the other, which last is called a reciprocating twisting motion. The first motion may be easily applied by any competent mechanic, and as it will be less useful than the other, I do not think it necessary for me to describe its application. The method of doffing full bobbins from this improved apparatus in all the figures, is exceedingly simple and effective, and it is done by merely releasing the catch, *z*, from the side of the frame-work

and removing the full bobbin, while the end of the sliver may be immediately passed round the empty bobbin which has been placed in the machine, without otherwise disturbing the machinery or stopping the operation of any of the working parts. But as the mode of doffing is an important part of my invention, when applied to the drawing and roving frames, in consequence of their running at a very great speed, I will describe it more particularly. The red lines in fig. 6, shew the position of some parts of my machinery during this process. When the bobbin is full, as at *h*, in fig. 6, the catch, *z*, being raised, allows the front part, *i*, of the frame to be turned upon its centre at 2, until its tail-piece, 3, coming in contact with the underside of the stationary frame-works stops it. At the same time the full bobbin, following the frame, *h*, rolls along the surface at the drum, *i*, and continues to wind on the sliver until the sliver is broken off. The empty bottom, 5, is now dropped into its place, where it is supported by a short projecting piece of the stationary frame-work, from which the full bobbin became free, in consequence of its increased diameter. As the full bobbin continues to wind on till the sliver is broken off, no particular hurry is necessary, and the attendant may deliberately turn the broken end round the empty bobbin, which then begins to wind on. The full bobbin is now to be removed, and the frame, *h*, raised to its former place, where it is again held by the catch, *z*, until the succeeding doffing.—In witness whereof, &c.

THOMAS KNOWLES.

Enrolled February 1, 1840.

Specification of the Patent granted to GOLDSWORTHY GURNEY, of Bude, in the County of Cornwall, Esquire, for certain Improvements in the Production and Diffusion of Light.—Sealed March 25, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My invention relates, first, to a mode of improving the illuminating powers of coal-gas, by subjecting it to the chemical action of certain substances hereafter mentioned, in its passage from the gas-main to the burners.

Secondly, my invention relates to a mode of applying reflectors, whereby the light produced may be more beneficially diffused; and, in conjunction with the use of such reflectors, the application of certain glass refractors of light.

Thirdly, my invention relates to the application of gas-burners made of concentric rings of tubing, perforated on the upper surfaces for the passage of gas, when such burners are used in combination with glass chimneys for lighting apartments and other places; and,

Fourthly, my invention relates to a mode of applying conical glass chimneys to lamps, in order to keep the flames thereof quiet, and most beneficially to supply them with air. And in order that my invention may be most fully understood and readily carried into effect, I will proceed to describe the means pursued by me in carrying out my invention. It is well known that the use of gas as a means of lighting rooms and internal parts of buildings, is comparatively little resorted to, owing to offensive smell, its great heat, and other objections arising from other causes. Now the first part of my invention has for its object the submitting of gas, in its passage from the supply-main to the burner or burners, to the chemical action of certain matters hereafter mentioned, whereby

gas will not only be greatly improved in its illuminative powers, but at the same time the heat of the burning gas will be reduced, and its use in rooms and apartments rendered inoffensive. The materials I employ for this purpose are muriate of zinc, subacetate of lead, chloride of baryta, and sulphate of manganese; and these materials are to be used either dry or slightly moistened, in similar vessels to what are used in purifying gas by what is called the dry-lime process, by which the gas in its passage through the vessel, is caused to pass in contact with as extensive a surface of the materials used as possible. And the object of the invention is to give to the consumer the opportunity of heating the gas to be consumed by him according to my invention, after it has passed through the ordinary processes of the gas-works; and for this purpose I apply a vessel of the description above mentioned, to the gas supply-pipe, by which the gas in passing from the gas-main of the gas company, may pass amongst and be chemically acted on by the matters above mentioned, or some of them, before coming to the burner or burners. The most important of the above mentioned materials is the muriate of zinc, and the use of that material alone will be found of great benefit, but I prefer to use therewith a mixture of the other matters above mentioned, and the mixture I have found best for the purpose is as follows:—

5 parts muriate of zinc,
2 parts subacetate of lead,
2 parts chloride of baryta,
4 parts sulphate of manganese.

And I have found that about 6lbs. of the mixture, placed in a vessel of the description above mentioned, (and which is well known,) and of about the following dimensions, 2 feet 6 inches long, 1 foot 6 inches wide, and 1 foot deep, to a supply-pipe of three quarters of an inch, internal diameter, and in proportion for larger or less supply-pipes, fully answers the purpose; and when in con-

stant use the materials above mentioned should be changed about every three to four weeks.

I would remark, that although I prefer the above described means of applying the above mentioned materials, I do not confine myself thereto, so long as the means resorted to are such as to bring the gas in contact with muriate of zinc, with or without other suitable matters, in the passage of the gas from the gas-main to the burner or burners.

I will now proceed to describe the second part of my invention, which relates to a mode of applying reflectors and refractors to lamps or burners, and consists of using reflectors with two surfaces, whereby a portion of the light may be diffused downwards, and the other portion of the light may be diffused upwards, the reflecting surfaces being placed intermediate of the length of the flame, consequently part of the flame will be below the reflecting surfaces, and the other portion of the flame will be above the reflecting surfaces, and by such means any determined portion of the light of a flame may be directed downwards or upwards ; for it will be evident that according as the reflectors are placed higher or lower, in respect to the length of the luminous part of the flame, so will the larger or less portion of the light be diffused downwards or upwards.

Description of the Drawing.

Fig. I, shews the section of a glass chimney of a gas-burner with a reflector, according to my invention. *a*, is the gas-flame ; *b*, is the chimney ; and, *e*, and *f*, are two reflecting-surfaces ; the reflecting-surface, *e*, diffusing the light of that portion of the flame which is below it, downwards ; and the reflecting surface, *f*, diffuses all the light of the part of the flame which is above it, upwards. And it is only desirable further to remark, that the reflectors are made of the usual materials, which are well understood, and

to be of such figures or curves as to diffuse the light to the extent desired. The dotted lines shew the application of a ground glass refractor above the reflectors; the shape of such refractor may be varied. The red lines represent the application of what I call a refracting-zone, which is placed above the reflectors, and may be used either separately or combined with the ground glass one. This refractor consists of a cylinder of glass, cut on the outside into prismatic projecting rings at such angles as to direct the light in the desired directions; by this means the light will be refracted in such manner as to produce a very agreeable effect, and will be an economical application of light.

Fig. 1, and fig. 2, shew a section and plan of a burner made of concentric rings, *g*, *h*, *i*, of tubing, perforated on the upper surface, as is shewn, care being observed not to perforate the tubes, *s*, by which the concentric rings are connected, and by which the supply of gas is made to the concentric rings. *b*, shews the upper glass chimney of the burner, which is supported at a point above the commencement of the flame, as is shewn. *l*, is the lower cone, the upper opening of which is larger than the outer ring of the burner, and there is an open space around the flame between the upper chimney, *b*, and the lower cone, *l*, as is shewn.

Having thus described the nature of my invention, I would wish it to be observed that what I claim as my invention is, first, the mode of heating coal-gas in its passage from the gas-main to the burner or burners, as herein described.

Secondly, I claim the mode of applying reflectors intermediate of the length of the flame: and I also claim, combined therewith and placed thereon, the use of a ground glass shade or refracting-zone, or both together, as above described.

Thirdly, I claim the mode of lighting apartments or

rooms, by means of burners composed of concentric rings of tubes combined with suitable glass chimneys, as above described; and,

Fourthly, I claim the mode of applying conical glass chimneys to gas-burners, as above described.—In witness whereof, &c.

GOLDSWORTHY GURNEY.

Enrolled September 25, 1841.

Specification of the Patent granted to WILLIAM HENSMAN, of Woburn, in the County of Bedford, Machinist, for Improvements in Ploughs.—Sealed December 30, 1840.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My invention relates to a mode of applying coulters of ploughs, in order to obtain more ready means of adjustment in respect to the beams of ploughs.

Description of the Drawing.

Fig. 1, represents part of the beam of a plough having a coultre applied thereto according to my invention.

Fig. 2, shews the portion of the beam separately. *a*, represents part of the beam of a plough. *b*, is a projection, formed or affixed on the beam, and becomes the fulcrum or surface on which the coultre moves, in adjusting the point of the coultre to or from the land side of a furrow. *c*, is the coultre; and *e*, is a plate, which partly embraces the beam, *a*. The coultre is secured by means of eye-bolts, *d, d*, which, passing through the plate, *e*, the nuts, *f*, are screwed on the screws of the eye-bolts, *d*. And it will be readily understood, that according as the screw-nut on the upper or lower eye-bolt, *d*, is more or less tight in respect to the other, so will be the position of the coultre; for the coultre will move on the projection, *b*,

as a fulcrum, and the coulter will be tightly held to the beam by means of the plate, *e*, and the bolts, *d*, and by having the projection, *b*, for some length on the surface of the beam, as shewn, the coulter can be set more forward or backward than is shewn in the drawing.

Fig. 3, shews another arrangement of means of applying a coulter. In this arrangement, the projection, *b*, in place of being on the beam, is on a plate, *g*, which is applied on one side of a beam of a plough.

The plate, *g*, is shewn separately at fig. 4. *d, d*, are the eye-bolts for holding and adjusting the coulter on the plate, *g*, and the lower bolt, *d*, in addition to holding and adjusting the coulter on the plate, *g*, the stem of the bolt passes through the beam of the plough, and thus allows the plate, *g*, to move thereon, as on an axis. *h*, is an adjusting-screw, which is attached by a pin-joint to the plate, *g*, such screw passing through a projection, *i*, formed or affixed on the beam, *a*; and *j*, is a screw-nut, by means of which the position of the point of the coulter may be set forward or backward. And it will be understood, that by this arrangement the coulter can be adjusted in two directions; that is, to and from the land side of the furrow, by means of the eye-bolts and screws, *d, d*, the coulter moving on the projection, *b*; and to and from the fore part of the plough, by means of the plate, *g*, and the screw and nut, *h, j*.

Having thus described the nature of my invention, and the manner in which the same is to be performed, I would have it understood, that what I claim, is, first, the mode of adjusting coulters of ploughs by the combined means of a projection, *b*, and screws, *d, d*, as herein described.

Secondly, I claim the mode of adjusting coulters by means of a plate, *g*, and adjusting and holding-screws, *d, d*, and *h, j*, also in combination with the parts, *b, d, d*, as herein described.—In witness whereof, &c.

WILLIAM HENSMAN.

Enrolled June 30, 1841.

Specification of the Patent granted to JOHN WHITEHOUSE, of Deptford, in the County of Kent, Engineer, for an Improved Method of Making Boilers to be used in Marine Steam-Engines.—Sealed May 25, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My improved method of making boilers consists of forming steam-boilers for marine steam-engines, each in two compartments, one above the other, both compartments having a steam-chest or chamber, in which the steam is received, at the same time the steam-chest or chamber is so arranged as to be separated from either of the two compartments, when, from any cause, either of the two compartments of which the boiler is composed, may be required to be put out of work, and the two sets of furnaces, for the respective compartments have their separate flues, the two compartments being independent of each other in respect to the water-spaces. And in order that my invention may be most fully understood, and readily carried into effect, I will proceed to describe the drawing hereunto annexed, in which the same letters of reference are used to indicate similar parts wherever they occur.

Description of the Drawing.

Fig. 1, represents a plan in section of the upper compartment of a steam-boiler, constructed according to my invention, there being three sets of the fire-bars shewn in their places, the other three sets of fire-bars not being shewn; each compartment of the boiler shewn in the drawing having six furnaces; but that number may be varied.

Fig. 2, shews a section of a steam-boiler taken from front to back, at the point A, A, of fig. 1, as is indicated by the red line thereon.

Fig. 3, is another section, taken near the front of the boiler.

Fig. 4, is a plan of the underside of the steam-chest or chamber. *c*, is the lower compartment of the boiler, which, in respect to the flues and water-spaces, is for the most part similar to the upper compartment, *D*, as shewn in fig. 1.

I would, however, remark, that I make no claim to the arrangement of the water-spaces and flues, as shewn, nor do I confine myself thereto, as they may be varied according to the judgment of the boiler-maker, such flues and water-spaces forming no part of my invention, and, separately considered, are very similar to other marine-boilers which have been before used. *E*, is the plate which divides the upper from the lower compartment of the boiler. *F, F*, are the steam-ways from the lower compartment, *c*, of the boiler into the steam-chest or chamber, *G*, there being valves, *H, H*, by which the steam-ways, *F, F*, into the steam-chest, *G*, may be closed, when from any cause it is desired to put the lower compartment, *c*, of the boiler out of work, without interfering with the working of the upper compartment, *D*, of the boiler, as will readily be understood on examining the drawing. The steam from the upper compartment, *D*, of the boiler, passes through the valves, *I, I*, into the steam-chest or chamber, *G*, the valves being used to close the passages from the upper compartment of the boiler into the steam-chest or chamber, *G*, when it is desired to put the upper compartment of the boiler out of work, without interfering with the working of the lower compartment, *c*, of the boiler. *J, J*, are the steam-pipes from the steam-chest, *G*, to the engines ; and it will be understood, that when both compartments of the boiler are at work, the four valves should be kept raised fully off their seats. The arrows point out the direction of the flame, heated air, and smoke, from the furnaces into the funnel or chimney, *K* ; but it will be seen, that the flues of one

compartment do not interfere with the flues of the other compartment, which is important to the invention, and the products from the furnaces of the upper and lower compartments do not come together till the products (flame, heated air, and smoke) of both arrive above the point, L, as will readily be traced on examining fig. 2, of the drawing. M, M, are the furnaces of the lower compartment, C, of the boiler, and N, N, are the furnaces of the upper compartment, D, of the boiler. It will therefore be seen, that the two compartments are one above the other, and work as if they were two separate boilers having a common steam-chest; the plate or partition, R, forming the bottom of one boiler and the top of the other.

The drawing clearly shews the manner of constructing a boiler with the requisite stays or braces, all which is well understood by boiler-makers, and will not require description in this my specification. It should be stated that there will require to be a platform in front of the boilers for the fireman to stand on, when attending to the upper fires.

Having thus described the nature of my invention, and the manner in which the same is to be performed, I would remark, that by the use of such boilers much space will be saved in large steam-vessels. And I would have it understood, that what I claim as the invention secured by the above recited letters patent, is, the improved method of making boilers for marine steam-engines, whereby one compartment is placed over another, with separate furnaces and fire-places, such compartments having communication with a common steam-chest, and each compartment capable of being separated from the steam-chest, without interfering with the working of the other of the compartments, as herein described.—In witness whereof, &c.

JOHN WHITEHOUSE.

Enrolled November 25, 1841.

Specification of the Patent granted to THOMAS JOSEPH DITCHBURN, of Orchard House, Blackwall, in the County of Middlesex, Ship Builder, for certain Improvements in Ship Building, some or all of which are applicable to Steam-Boats and Boats and Vessels of all Descriptions.—Sealed March 8, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My invention relates to certain modes of ship and boat building, by planking with wood, on frames composed of iron bars, the most convenient form of which are angle iron bars, as they are technically called by engineers, and as represented in the drawing; but bars wrought in the form of a T called T iron bars might also be used, but are much less convenient and simple. And in order that my invention may be most fully understood, and readily carried into effect, I will proceed to describe the drawings hereunto annexed; in each of the figures of which, the same letters of reference are used to indicate similar parts. The strength of the iron bars to be employed will, of course, vary according to the description of ship, vessel, or boat.

Description of the Drawing.

The framing of angle iron bars for a ship or a vessel, or steam or other boat, is to be constructed similarly to a framing for a like ship or vessel, or steam or other boat, when according to my invention, as if such framing of angle iron bars were about to be planked with plates of iron in the usual mode of building what are termed “Iron Ships,” and “Iron Boats,” there being only slight variations, in order to render such framing fit for being planked with wood, all which will readily be understood on a careful examination of the drawing, aided by the description herein given.

Fig. 1, shews an inside view of part of the side of a ship or vessel constructed according to my invention.

Fig. 2, is a transverse section of fig. 1, by the aid of which, and the other figures hereafter mentioned, I shall be enabled fully to describe the nature of my invention, and in such manner, that a workman may readily work therefrom, and apply my invention in the building of any class of ship, vessel, or steam or other boat. *a, a*, is the angle iron, of which the frame is composed or constructed. *b*, is the outside planking of wood; and *c*, is the inner planking of wood: the angle iron bars being let into the inner lining or planking, *c*, so that the outer and inner planking will come together, as is shewn by the section, fig. 2, and more clearly by the enlarged section of a portion of a ship's side, shewn in fig. 3; and the inner and outer planking, with the angle iron bars, are all secured by screw-bolts and nuts, *d, d*, as is shewn. And, in order to secure the ends of the outside planking, there are short lengths of angle iron bars, *e, e*, affixed to the angle iron bars or ribs, *a*, as is shewn in fig. 4, the short portion of the angle iron bars being affixed by rivets or screw-bolts or nuts, *h, h, h*. And it should be remarked, that I prefer to use hair-felt between the inner and outer planking, *b* and *c*. And the seams of the planking are to be caulked as usual. By this mode of planking on angle iron bars or frames of a ship, vessel, or boat, great strength and lightness may be obtained. And in order that the ship, vessel, or steam-boat may keep its figure, particularly when of considerable length, I apply truss-plates of iron, *f, f*, fig. 1, or diagonal plank or ceiling, as it is called; and I prefer that such truss-plates of iron and diagonal plank should be at an angle of 45° to the vertical position of the angle iron bars. And I also apply other iron-plates, *g, g*, which I call suspension-plates, let in flush in the outer planking, as is shewn in fig. 1; and I prefer that these suspension-plates, *g, g*, should, at the stem and stern, be at an angle of about 75° to the vertical position of the

angle iron bars, and as they come towards the midships to approach to 50° . These truss-plates and suspension-plates may have screw-bolts passed through them, secured with nuts where they cross each other, and also at the points where they cross the angle iron-frame, *a, a*, as at *k*, fig. 1; but these screw-bolts and nuts are not absolutely necessary, as such points of crossing do not often occur. The description above given, of a mode of constructing ships and vessels, and steam-boats, is intended for larger classes of vessels, and where great strength is required; but for smaller vessels and steam-boats, and also for other boats, where lightness is required, I omit the inner planking, as is shewn by the section of a vessel, fig. 5, where only the outside planking, *b*, is used; and the same is secured to the angle iron bar framing, *a, a*, by means of screw-bolts and nuts, such screw-bolts passing through the planking, and through the angle iron bars; and short portions of angle iron bars are used where two planks come together, as was described in fig. 4, or the two ends may lap or scarf over each other, as is usual in boat-building. The seams of a vessel so planked by single outside planking on angle iron bars, is to be caulked in the usual way. I would remark, that when the planking, particularly the inner-planking, is several inches thick, in place of using screw-bolts with nuts, as fastenings, bolts may be used and fastened by rivetting on washers; but I do not consider such mode of fastening to be so good and secure as screw-bolts and nuts, especially in steam-vessels near the boilers. And in order to retain the nuts securely on the bolts, when the nuts have been screwed up tight, I upset the end of the screw by hammering.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood, that I do not claim as part of my invention the angle iron bars, or the Γ iron-bars, or any of the parts singly used or employed in constructing a ship, vessel, or

boat, according to my plan of building ; and although I prefer the use of single angle iron, as shewn and described, double angle iron, called T iron, may be used for the framing ; in such case the short lengths, *e, e*, where the ends of planks come together, will be dispensed with ; but I claim, first, the mode, hereinbefore described, of outer and inner planking with wood, upon angle iron bars, whether such bars be angle iron bars, or T iron bars ; and,

Secondly, the mode of outer planking with wood upon angle iron bars, and secured by screw-bolt fastenings, as above specified.—In witness whereof, &c.

JOSEPH DITCHBURN.

Enrolled September 8, 1841.

Specification of the Patent granted to CHARLES DELBRÜCK, of Oxford Street, in the County of Middlesex, Gentleman, for Improvements in Apparatus for applying Combustible Gas to the Purposes of Heat.—
Sealed September 10, 1840.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—
The invention relates, first, to a mode of constructing apparatus to be used as a hand tool for joining metals.

Secondly, to a mode of heating surfaces for mechanical and manufacturing purposes, by causing a series of jets of atmospheric air to be propelled through or near to gas permitted to flow through a chamber or chambers ; and,

Thirdly, the invention relates to a mode of consuming gas in pipes or tubes, by propelling jets of atmospheric air into such pipes or tubes, for applying the heat thereby obtained to evaporate fluids, and other useful purposes.

And in order that the invention may be most fully understood, I will proceed to describe the drawings hereunto annexed, and the figures and letters marked thereon.

Description of the Drawings.

Fig. 1, represents the section of a hand-tool for joining metals. A, is the handle by which the workman holds the tool, when using the same for soldering purposes. B, is the tube through which the inflammable gas passes; and c, is an internal tube through which the atmospheric air passes. d, is the copper bit, which is heated by the flame of gas which flows from the open end of the tube, n; and the intensity of the flame is regulated by the pressure of the air passing from the small hole in the nozzle of the tube, c. I usually employ air propelled through the tube, c, by a pressure equal to four to five inches of water or more, the workman varying such pressure, as he wishes to make the flame more or less intense, by means of a stop cock. E, is a flexible tube which conducts the gas to the gas-tube; and, f, is a flexible tube by which the atmospheric air is conducted to the air-tube, which also has a stop-cock to regulate the flow. I would here remark that this tool is to be used in a similar manner to the tools described in the specification of a patent granted to Luke Hebert, of Camden Town, in the County of Middlesex, Patent Agent, bearing date at Westminster, the 31st day of May, 1838, for "a new and improved method or methods of uniting or soldering metallic substances;" and which patent has been assigned to me, and the novelty of construction consists in the circumstance of having the tubes, B, c, one within the other, and the gas and air only coming together at or about the point of combustion, when the air is passed through the internal tube. The tool being shewn suitable for consuming gas at the ordinary pressure of gas supplied by gas-works; and in the event of using the tool to join

metals by the direct action of the jet of flame, then the copper bit is to be removed. And it should be stated, that there may be several tubes, c, producing each a jet of air in an enlarged tube, B, when a large tool is used. I will now proceed to explain the second part of the invention, which relates to a mode of obtaining a series of jets of flame for heating an extent of surface.

Fig. 2, shews a section of an apparatus made according to this part of the invention.

Fig. 3, shews a plan of fig. 2; and,

Fig. 4, shews a transverse section of the same apparatus. B, is a chamber open at the upper part; at the lower part there is a gas-pipe which is to have a stop-cock, to regulate the supply of gas to the upper chamber, B.

It will be evident, that, if the gas flowing through the chamber, B, be lighted, and the combustion simply supported by the surrounding atmosphere, there would be a single flame, which may be very properly called a soft flame having little intensity of heat, and in such form would simply represent an enlarged flame of gas, which would be of little value for heating purposes, but when supplied with a series of jets of air, the single flame will be converted into as many flames as jets of air, and such flames may be made more or less intense or sharp in their action by the degree of pressure to which the air supplied to the jets is subjected, and I apply the air under a pressure equal to three inches upward, to one or two feet of water depending on the intensity desired, and in using the apparatus the workman regulates the supply and consequent pressure of the air by a stop-cock. c, c, are tubes passing horizontally across the chamber, B, having each several small holes pierced therein, through which the atmospheric air is forced. And I would remark, that in supplying air to such apparatus, it is desirable to have the blast as uniform as possible; for which purpose the air

from the blowing machinery should force the air into a large vessel or regulator, as is well understood in various manufactures, in regulating blasts of air; or the air may be supplied from a vessel similar to a gasometer. The apparatus above described may be extended to any desired size, depending on the extent of surface to be heated thereby, and thus may a very uniform heat be obtained throughout the whole surface so heated, and at the same time the temperature may be raised or lowered by varying the pressure at which the air is supplied, by a stop-cock, as before stated.

Fig. 5, shews the section of a tube or pipe to which heat is to be obtained by consuming gas therein, by means of jets of atmospheric air propelled into the same. B, represents a tube through which gas is permitted to flow; and C, is another tube through which atmospheric air is to be propelled, there being numerous holes formed in an inclined direction, in such manner as to cause the general current to pass through the tube in the direction of the arrows; the tube, B, opening into a chimney or flue at its further end, and the gas is supplied by a pipe at the other end. If the gas be lighted, and the air forced in jets through the openings of the pipe, C, there will be a number of jets or flames equal to the jets of air, and thus may a number of jets be kept burning within a tube or pipe, or such like chamber, and the heat thereby produced made more or less intense, depending on the pressure of the air supplied, which is regulated by a stop-cock, as before explained. It will be evident, that if one or more of such tubes, B, be introduced, and affixed in boilers or vessels containing fluids, such fluids would be heated, and, if desired, the extent of heating surface may be such as to evaporate the same more or less quickly.

Fig. 6, shews the section of another tube or pipe. In this case; the gas-tube, B, is on the interior of the pipe, C, but the effect of working will be the same.

Fig. 7, shews another arrangement of pipes or tubes

fixed side by side, the jets of air being propelled into the gas contained in the tube, B, in an inclined direction, as before explained. By either of these modes of apparatus the gas will be consumed in the form of a series of jets within the tube or pipe, B; and by such means the tube or pipe, B, may be quickly made red-hot, when not surrounded by fluid or other matter, which will quickly carry off the heat so obtained to the tube or pipe, n; or by lowering the degree of pressure at which the jets of air are supplied, the temperature of the tube may be regulated to almost any required degree below red-heat, and with considerable uniformity, notwithstanding the tube may be several feet long; such means of heating tubes or pipes may, therefore, in addition to being highly useful for heating and evaporating fluids in suitable vessels, be applied to other useful purposes.

Having thus described the nature of the invention, and the manner of performing the same, I would remark, that I am aware that gas has been before used as a means of communicating heat for various purposes, and inflammable gas has before been combined with atmospheric air under pressure, and used as a tool or instrument for joining metals; I do not, therefore, claim the same generally, but only when the apparatus for consuming inflammable gas for applying heat for various purposes, are constructed according to the modes above described, but what I claim, is, first, the mode of constructing an apparatus or tool for joining metals by combining the air and gas-tubes or pipes thereof, one within the other, and bring the gas and air together at or about the point of combustion, when the air passes through the interior tube, as above described.

Secondly, I claim the mode of constructing apparatus for consuming gas, when applying it for the purposes of producing heat, by causing a series of jets of air to be propelled amongst or near a flame of gas, as described in respect to figs. 2, 3, and 4; and,

Thirdly, I claim the mode of applying jets of air into a tube or pipe through which inflammable gas is passing, as described in respect to figs. 5, 6, and 7. And, in conclusion, I would remark, that when speaking of inflammable gas, I prefer to use the carburetted hydrogen gas of gas-works, when cheapness is considered; and pure hydrogen, when great intensity of flame is required.—In witness whereof, &c.

CHARLES DELBRÜCK.

Enrolled March 10, 1841.

Specification of the Patent granted to JAMES MOLYNEUX, of Preston, in the County of Lancaster, for an Improved Mode of Dressing Flax and Tow.—Sealed July 28, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My invention consists in dressing the flax and tow on a machine similar in many respects to a silk dressing-machine, but adapted, by various alterations and additions, to the purposes of my invention, and necessarily of much larger dimensions and of increased strength. And I do hereby describe the manner in which my said invention is to be performed by the following statement thereof, reference being had to the drawings on two sheets marked A and B, annexed, and to the figures and letters marked thereon, similar letters being used to denote similar parts wherever they occur in all the drawings.

Description of the Drawings.

In sheet A, fig. 1, represents a side view of one of the said machines. The parts marked A, constitute the frame of the machine. B, is the table for holding the strick-

boards and intermediate slips, and is here shewn as run under the carding combs or heckles. This table runs upon the small truck-wheels, *c, c*, on a railway, *d, d*, and turns at its centre on a pivot-pin, *e*, for the convenience of presenting the stricks in opposite directions to the heckles, by turning the table end for end, when the flax has been heckled sufficiently in one direction. The boards which hold the stricks in this table are precisely similar to those in silk machines, except that they are stronger and of larger dimensions, and their intermediate slips broader. The boards and slips are screwed firmly together side by side, with end set screws in the same way, also, as those of the silk dressing machines. *f, f*, are the lever segments which raise the table, and consequently the flax, up to the heckles, gradually, while drawing the segment into the position shewn by dotted lines, by means of the chair, *g*, and connecting-rod or bar, *g*. This gradual elevation of the table causes the heckles to commence their action on the surface of the strick, and gradually to penetrate through it, completing the straightening of the fibres as they proceed. The parts marked, *h*, are the combs and heckles on an endless band, moving in the direction of the arrows; and to the back of each of the combs or gills is fixed a flat piece of polished iron, *v*, about half as high as the teeth of the combs or gills, which prevents the flax entering too far into the teeth, and allows the brushes to clear them of the tow or flax more readily. In order to clear these heckles as the work proceeds, I have invented the following apparatus:—*i*, is an arm forming the support, together with a similar one on the opposite side of the machine, of the two rollers, *j, j*, which carry the endless-band, *k*, furnished with brushes, *l*, which clear the heckles of the tow collected upon them during the heckling process, and these brushes are in turn cleared by the stripper or doffer-wheel, *m*, which strips the tow off from them, and throws it into the tow-box, *n*, where it is collected to be afterwards

dressed or acted upon in my improved mode, if required. *o*, *p*, are two set screws to regulate the tension of the web or endless band on which the heckles are placed; the rollers over which this band passes being set in sliding-frames, *q*, *r*, which are acted upon by the set-screws, *o*, *p*, for that purpose. When the table has been raised up to the proper height, it is necessary that it should drop again for the next operation; and to accomplish this, I have invented the small contrivance, *s*, which is a trigger-lever, acted upon by the table when at its greatest elevation, as shewn by the dotted lines. When this lever, *s*, is lifted, its end passed off from the end of the bob-weighted lever, *t*, which then falls and thus raises the small forked-lever, *v*, which acts under the creeper-bar, *w*, and forces it upwards away from the ratchet-wheel, which being thus set at liberty, the weight of the table brings it down to its starting or rest-point again, when the click is raised, and the handle, *x*, turned backwards by its handle, *z*. This creeper-bar, *w*, winds up the table, *n*, gradually, by means of the eccentric, *x*, in the same manner as is common to silk dressing-machines. *y*, is the fly or handle-wheel for lowering the table, and *z*, its handle, by which the necessary motions are given to the table; while *a*, *a*, is the driving-band working over the fast and loose pulley, *b*, which drives the web containing the heckles and the gearing connected therewith, the various motions of which are as follows:—The band, *a*, *a*, drives the pulley, *b*; the pulley, *b*, has a pinion on its axis, which drives the toothed-wheel, *d*; and this toothed wheel is fixed on the axis of the drum or roller, *e*, which carries and drives the endless web on which the heckles, *n*, are set. This web drives the opposite roller, *f*; and on the axis of this roller, *f*, is the toothed-wheel, *h*, and pulley-wheel, *i*, which latter-wheel, *i*, by means of the band, *j*, or gearing, as the case may be, drives the doffer, while the former-wheel, *h*, drives the two pinions, *m*, *n*, through the medium of the connecting-wheel, *r*.

The pinion, *n*, is fixed on the shaft of the roller, *j*, over which the endless-band carrying the brushes passes, and which band drives the corresponding roller, also marked *j*, and thus the whole of the upper parts of this machine is set in motion, while the lower parts take their motion from the creeper-bar, *w*, as follows:—Each time that the eccentric, *x*, revolves, the creeper-bar, *w*, forces round the ratchet-wheel in which the creeper works, a tooth or more, as the case may be. On the shaft of this ratchet-wheel is the pinion, *y*, which turns the toothed-wheel, *z*, below it, while the pinion on the shaft of the wheel, *z*, turns the toothed-wheel, on the shaft, *k*, on which is a conical drum, *x*, which winds the chain, *g*, upon it, to raise the table. *t*, is a click or paul fixed to the framing, *A*, to prevent the table falling suddenly, when the creeper-bar, *w*, is removed, and holds it up till the operator takes hold of the handle, *z*, of the wheel, *v*, and removes the click, *t*, when he can gently lower the table.

Fig. 2, is a plan of the underside of the table, *B*.

Fig. 3, a longitudinal section; and,

Fig. 4, a transverse section of the same.

Fig. 5, is a perspective view of one of the strick-boards open to receive the flax; and,

Fig. 6, the same boards filled with flax, and closed ready to be inserted in the table.

In sheet *B*, fig. 1, represents an end view of the machine, described in sheet *A*, fig. 1. In this view the table is shewn run out on the rails, *D*, *D*. From under the machine, *x*, is the conical drum, on which the chain, *g*, is wound, and which, by its conical form, gradually diminishes the speed at which the table rises, in proportion as the teeth of the heckles get deeper into the flax.

Figs. 2, 3, 4, and 5, shew the various sizes or coarseness of the teeth used in the progress of dressing the flax, beginning always with the strongest, and ending with the finest; and,

Figs. 6, 7, 8, and 9, represent the leather backs into which the said teeth are set.

In sheet A, fig. 7, shews another arrangement of apparatus for clearing the heckles as the work proceeds, and which I place at the opposite end of the machine to that shewn in fig. 1. It consists of a revolving brush-cylinder, (1), working in the same direction as the heckles or gills, and which in its turn is cleared by a card-cylinder (2) and doffer (3). The brush-cylinder (1) receives its motion from a toothed-wheel (4) fixed on the shaft of the roller, *e*, which wheel is turned by a pinion (5) on the axle of the driving-pulley, *b*, the wheel (4) also gears into and turns a wheel, (6), a pinion (7) on its axle driving the wheel (8) fixed to the shaft of the card-cylinder (2), which revolves in an opposite direction to the brush-cylinder (1). The doffer (3) is worked by a crank fixed on the shaft of the brush-cylinder (1) by means of the connecting-rod (9). In this figure also I have shewn the slips which hold the boards in the table to be made concave or hollowed out, by which the yield of flax is more advantageous, and prevents so much being made into tow.

Now whereas I claim as my invention the dressing flax and tow in a machine, such as I have herein described, having either one of the clearing and doffing apparatus, shewn in the drawings; the stopping bob-weighted lever apparatus, *s*, *t*, *v*. And the hollow or concave slips between the boards, also shewn in the drawing attached thereto, and such my invention being, to the best of my knowledge and belief, entirely new, and never before used in that part of her said Majesty's United Kingdom of Great Britain and Ireland, called Scotland, I do hereby declare this to be my specification of my said invention, and that I do verily believe this my said specification doth comply in all respects fully and without reserve or disguise, with the proviso for that purpose in the said recited letters patent contained; wherefore I do hereby claim to maintain exclusive right and privilege to my said invention.—In witness whereof, &c.

JAMES MOLYNEUX.

Enrolled June 16, 1841.

Specification of the Patent granted to GEORGE MACKAY, of Mark Lane, in the City of London, Ship Broker, for certain Improvements in Rotary Engines.—Sealed May 5, 1840.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention of certain improvements in rotary engines consists in a similar combination and arrangement of the parts, whereby much compactness of form is obtained and economy secured; and also in such an application of the elastic force of the steam employed therein, as to ensure the greatest efficiency of action. This invention is applicable in all cases where a motive power is required, but is especially suited to circumstances wherein a saving of space is an object.

I will proceed now to describe more fully the nature of this invention, referring to the several figures of the accompanying drawing, in all which similar letters indicate corresponding parts.

Description of the Drawing.

Fig. 1, is a sectional elevation of the main working parts of the engine, the frame-work being removed in order the better to shew the parts.

Fig. 2, is a front view of the engine complete; and,

Fig. 3, is a side view of the same. A, is the ordinary steam-pipe, being fitted with a cock, B, by which the supply of steam to the engine is regulated. This cock is opened and shut by a rod, C, working through a slot, and between guides in the bar, D, which bar is jointed at one end to the lever, E, (and having its fulcrum at *e*, thus acts upon the valve, F,) and has the reverse end connected with the spring, G, for the purpose of regulating its action on the valve. H, is a ratchet-wheel suitably mounted, as shewn, on the axle of which the spring, G, acts, and is

thereby enabled to yield freely to the impulse of the bar, D. The ratchet-wheel is furnished with a pall or click to prevent its turning the opposite way to that required. I, is a steam reservoir or receptacle, answering to the ordinary cylinder, but which is here represented in the form of a quadrant; it is placed over the wheel, N, so that the projections or studs, P, upon its periphery, may successively be presented to the action of the steam admitted into the reservoir, I. This wheel, N, (it will be seen on reference to fig. 2,) has its shaft, V, properly mounted and turning in plummer-blocks fixed on to the framework of the engine. J, is a valve for keeping in the steam until the projection or stud, P, which is being propelled forward by its elastic force, passes the mouth of the eduction passage, L; this valve is closed by a spring, K, the moment it has allowed the projection or stud, P, to pass by it out of the reservoir, I. T, is a fly-wheel for regulating the motions of the engine. The operation of this engine is as follows:—On steam being admitted to the reservoir or quadrant, I, (the parts being in the position shewn in fig. 1,) its elastic force is exerted between the valve or shutter, F, and the stud, P, the former being unable to move in the direction in which it is thereby urged, acts as an abutment for the steam, while the latter is driven forward by its pressure, and filling exactly the space between the outer rim, N, and the internal periphery of the quadrant, I, it receives on its surface the full force of the steam, until it reaches the mouth of the eduction passage, L; when, after allowing the steam to escape, it passes off through the valve, J, just previous to which time another projection or stud has entered the quadrant to the valve, F, to be acted on in a similar way. I would here remark, it must be evident that by applying the steam in the way described, there is a considerable leverage obtained upon the shaft, which would be the medium for transmitting, in any convenient way, the power from the engine, to any machinery required to be worked by it. I

will now explain the action of the valve, *r*, as seen at fig. 1 : it is in full action, that is, serving as an abutment for the steam, and is kept in its present position, until the inclined plane of the advancing projection or stud, *p*, coming in contact with it, forces it up into the recess, *x* ; the consequence of which is that the lever, *e*, is thrown into nearly a horizontal position, carrying with it the bar, *d*, which, acting upon the rod, *c*, shuts the cock as soon as the valve, *r*, begins to open. The whole of this mechanism remains as described, (and shewn by dots in the figure) until the stud, *p*, has passed from under the valve or shutter, *r*, and entered the steam-reservoir, *i* ; when the spring, *g*, causes it to fly back against the periphery of the wheel, *n*, which motion also opens the cock, *b*, and thus admits a fresh supply of steam to act upon the stud, *p*.

Having thus described my invention of certain improvements in rotary engines, I desire to be understood, that I do not mean or intend to confine myself to the precise form or arrangement of mechanism shewn, as I am quite conscious it is susceptible of considerable modification, but have exhibited that set forth in these presents as a convenient mode of carrying out my invention, laying no claim, however, to any of the parts separately, but simply as they are used in combination.—In witness whereof, &c.

GEORGE MACKAY.

Enrolled November 5, 1840.

Specification of the Patent granted to RICHARD LAMING, of Gower Street, Bedford Square, in the County of Middlesex, Surgeon, for Improvements in the Production of Carbonate of Ammonia.—Sealed May 6, 1841.

To all to whom these presents shall come, &c. &c.—
To obtain the salt, which in commerce is called carbonate of ammonia, either animal matters are subjected to destructive distillation, or a mixture of carbonate of lime and some ammoniacal salt is exposed to a high temperature; the carbonate of ammonia is by this means volatilized, and it is usually passed into condensing vessels or chambers, in which it accumulates either in a concrete state or more or less dissolved in water. Now, by my improved process, instead of distilling an ammoniacal carbonate direct from any substance or mixture capable of supplying it, I obtain the salt, either in a solid state, or dissolved more or less in water, by mixing together its separate acid and alkaline constituents, and these are the improvements which I claim as my invention. One of the processes which I use for this manufacture, is to cause ammonia gas and carbonic-acid gas, (obtained separately from any convenient sources,) to traverse a succession of leaden chambers, maintained at as cool a temperature as may be conveniently practicable, and so contrived as to favour the admixture of the dissimilar gases. In this process it is not essential that the two gases be present in their combining proportion, it is preferable that the carbonic-acid be in greater abundance than will combine with the ammonia which is present. Sometimes I place in one or more of the chambers a stratum of water, or of water impregnated with ammonia, and then introduce to it carbonic-acid and ammonia gas or carbonic-acid gas, in which cases I am enabled to obtain in the resulting salt or saline solution,

a larger proportion of carbonic-acid gas than when only the hygometric moisture of the aeriform fluid is present. I do not restrict my claim to any particular forms or construction of apparatus, but I claim the invention of making carbonate of ammonia, by mixing its acids and alkaline constituents in any convenient apparatus, in all cases in which those constituents are obtained by different processes or supplied from different vessels, and whether they be pure or more or less mixed with air, or other gases or matters. When carbonate of ammonia, which has been mixed with other substances for any purpose in the arts, is to be recovered by exposing the mixture to a high temperature, it may be thought to save ammonia, by condensing the salt in a chamber or vessel containing carbonic-acid gas; I, therefore, disclaim as any part of the invention the use of carbonic-acid gas, for the purpose either of recovering or preventing the loss of carbonate of ammonia; my invention having for its end only the first production of carbonate of ammonia. When carbonate of ammonia is made by the ordinary processes of distilling animal matters, or a mixture containing an ammoniacal salt, it may be thought to conduce to a greater product to maintain the condensing chambers full of carbonic-acid gas; but I do not claim as any part of my invention the use of carbonic-acid gas, for increasing the quantity of carbonate of ammonia, to be obtained by any of the ordinary processes of distillation. The carbonate of ammonia usually met with in commerce, is called by chemists sesqui-carbonate of ammonia; besides this there is a second variety containing a lesser quantity of carbonic-acid, called by chemists, carbonate of ammonia, and also a third which contains a larger proportion of carbonic-acid, and which chemists name the bi-carbonate of ammonia.

Now, I do not claim as any part of my invention, the conversion of carbonate of ammonia into the sesqui-carbonate or the bi-carbonate, nor the conversion of the sesqui-car-

bonate in solution to carbonic-acid gas ; but I claim as my invention the formation of these several salts, or varieties of salt, or any mixture of them, by the exposure of carbonic-acid gas to ammonia in solution, either alone or mixed with one or more of the carbonates of ammonia.—
In witness whereof, &c.

RICHARD LAMING.

Enrolled September 15, 1841.

Specification of the Patent granted to CHARLES THOMAS HOLCOMBE, of No. 6, Bankside, in the Borough of Southwark, Iron-Merchant, for certain Lubricating or Preserving Matters for Wheels and Axles, applicable also to the Bearings, Journals, and other Parts of Machinery.—Sealed March 6, 1841.

To all to whom these presents shall come, &c., &c.—
The object of my invention, so far as relates to lubricating matters, is to render a certain mineral grease, the production of coal-tar, and commonly called naphthaline, when mixed up and manufactured with the materials, and in the manner described in the first, second, and third processes hereinafter set out, useful and applicable for lubricating the wheels, axles, bearings, and journals of machinery ; and the object of my invention, so far as relates to lubricating and preserving matters, is to render a certain mineral oil, also the production of coal-tar, and commonly called dead-oil, when mixed up and manufactured with the material, and in the manner described in the fourth process, hereinafter set out, useful and applicable for lubricating wheels, axles, bearings, and journals of machinery, and for preserving any wheels, axles, bearings, journals, and other parts of machinery, when externally applied thereto, which invention I propose to carry into effect in the manner hereinafter described, that is to say :—

First Process.

I take of naphthaline, in the rough and chrystallized state, about 5 cwt., and boil it for about three hours with about two or three bushels of tan ; and I also boil therewith about 35 lbs. weight of soda. Sometimes I boil animal charcoal alone with the naphthaline, and sometimes I boil catechu, commonly called japan earth, with the naphthaline. The naphthaline thus prepared, either with the tan or soda, or with the animal charcoal, or catechu, is strained through a fine wire sieve, and left to cool. I now melt together about 40 lbs. weight of rosin, and 30 lbs. weight of bone, or horse-fat ; 35 lbs. weight of Russia tallow, and 2 cwt. of palm-oil, as a mixture ; and I grind this mixture with the naphthaline when so prepared, either with the tan and soda, or with the animal charcoal or catechu as aforesaid, in a mill similar in all respects to a common paint-mill.

Second Process.

I take about 3 cwt. of the naphthaline, when prepared as in the first process, either with the tan and soda, or with the animal charcoal or catechu ; I then mix with it about 23 lbs. weight of black-lead, and 20 lbs. weight of stockholm tar ; and I grind together, in a mill similar in all respects to a common paint-mill. The grease thus formed is of an inferior quality to that described in the first process.

Third Process.

I take about 3 cwt. of naphthaline, when prepared as in the first process, either with the tan and soda, or with the animal charcoal or catechu, and mix it with 28 lbs. weight of stockholm tar, and 28 lbs. weight of bone-fat, or any other suitable fatty, vegetable, or animal substance. I grind the whole together, in a mill similar in all respects to a common paint-mill ; the grease thus formed is of quality still inferior to that described in the second

process. Sometimes I add a quantity of rosin in the manufacture of the grease described in the second and third processes; and I decrease, in such second and third processes, the quantity of tan and soda, animal charcoal, or catechu, used in the boiling, in proportion to the difference in the quantity of naphthaline used in the first, second, and third processes. In the above descriptions, I do not mean to confine myself to any particular mode or proportions of the materials or ingredients used; but my claim is solely for the use of naphthaline as the basis of my invention in lubricating matters.

Fourth Process.

I put a quantity of about 50 or 60 gallons of the dead-oil, before mentioned, into a pan or cauldron, and boil it with about one bushel of tan, or I boil the same with catechu alone, or with catechu and tan; I also boil about 28 lbs. weight of soda with the dead-oil and tan, or with the dead oil and catechu alone, or catechu and tan. I then strain the mixture off, and let it cool, and when cool I bag it in the same manner as sperm oil is usually bagged; I then add about 2 lbs. weight of palm-oil, or 2 lbs. weight of horse-grease, to each gallon of mixture; but the palm-oil or horse-grease may be added in the same proportion before the mixture is bagged. In the above description I do not mean to confine myself to any particular mode of manufacturing, nor to the particular quantities or proportions of the ingredients used, but my claim is solely for the use of dead oil as the basis in such lubricating matters, and preserving matters, when so mixed, in manner aforesaid, with any proportion of animal or vegetable oils or grease.—In witness whereof, &c.

CHARLES THOMAS HOLCOMBE.

Enrolled September 6, 1841.

Specification of the Patent granted to EDWARD PALMER, of Newgate Street, in the City of London, Gentleman, for Improvements in Producing Printing Surfaces, and in Printing China, Pottery Ware, Music, Maps, and Portraits.—Sealed June 12, 1841.

To all to whom these presents shall come, &c. &c.—My invention, consists, first, of a mode of obtaining printing surfaces by drawing or painting on silver or copper, or other metallic or conducting surface or surfaces, or by painting or drawing on other surfaces made conducting, after painting or drawing thereon, in such manner as to enable me, by the use of the known process of electrotype, or electrography, to obtain copper or other metallic plates or other surfaces, with sunken surfaces, from which prints may be taken, as from engraved copper, or steel plates, or rollers.

Secondly, my invention consists in a mode of drawing or painting on copper or other metallic or conducting surface or surfaces, or on surfaces made conducting, after painting or drawing thereon, so as to enable me, by the use of the aforesaid process of electrotype, or electrography, to produce or obtain on copper or other metallic plates, with raised surfaces, from which prints may be taken, as from engraved wood-blocks or stereotype-plates.

I now proceed to describe the mode by which the first part of my invention is carried on :—Having first obtained a silver, or German silver, or albata, or copper, or other metallic plate, or surface made metallic, for the purpose of electrotyping, of the required size, which will not be prejudicially acted on by the solution used, with its face whitened, if copper be used, either by a deposit of silver by electric deposition, or by a coating of silver plated on it by other means, or by a coating of platinum, or any other white metallic or conducting surface or surfaces, made metallic or conducting for the process of electro-

typing, and having soldered, or otherwise suitably affixed, a small strip of copper to the back of the plate, or surface, for the purpose of connection with a voltaic-battery, the artist can make his outline in any way considered the most suitable—to which making an outline I make no claim. If the electro-tint painting be made from the life, the composition hereafter to be described can be used with a fine sable-pencil, if slightly thinned with spirits of turpentine ; but if the artist be desirous of transferring the outline of a sketch already made, it may be traced in the ordinary way, and rendered more permanent by slightly scratching the surface. When a satisfactory outline has been obtained, the plate or surface is to be placed in such a position as to reflect the window of the apartment, or a white surface of some kind, such as an engraver's shade, in order to see more clearly the work as it is produced on the surface of the plate : if the surface be a dull white, or aqua-tint ground, this is not absolutely necessary. The painting may then be produced, with the polished or white surface of the plate being left uncovered in those parts where absolute white is required, the composition laid on thickly and roughly in the dark and black portions, and the intermediate shades rough and thick, in proportion to the degree of "color" or "tone" required. It is necessary to bear in mind, that a picture painted smoothly, especially in the dark parts, however perfect it may appear on the plate, will not produce an impression capable of receiving and transferring the printing-ink in an equal degree, as the rubbing which it undergoes to take off the superfluous ink renders all the smooth portions of the plate nearly bare. To obtain a regular roughness, sufficient to retain the printing-ink, and at the same time to produce an appropriate "texture," various modes of "handling" may be employed ; for instance, a flat tint made by spreading the composition over the plate, and striking a fitch or hog hair-brush perpendicularly all over it, will give an impression in the electro-tint plate that will

retain the printing-ink by numberless minute indentations. Cut brushes of different sorts make a series of continuous lines on the plate of different degrees of fineness, which form corresponding indented lines in the voltaic-deposit capable of receiving and transferring the ink, so as to produce the same effect on paper or other material as had been previously obtained on the plate. A mixture of the styles of handling already mentioned will be found useful ; that is, the texture produced by the cut-brush being slightly softened by dabbing the fitch-brush perpendicularly on it. A "dragged" texture can be produced by passing a soft brush, held in a slanting position, quickly over the surface, after the brush has been well filled with the composition, slightly thinned with spirits of turpentine. This can be done over a tint already laid on, if a little care be taken not to disturb the composition. The modes of handling may be varied so as to obtain the texture an artist may desire. The composition to be used by artists in the electro-tint paintings is made of the undermentioned ingredients. I do not, however, confine myself thereto, as the same may be varied. One part by weight of white wax, two of lard, and one of lamp black, melted together, and stirred till nearly cold. To render this composition fit for use, it is to be ground with a small quantity of olive oil. The consistence required depends in some measure on the nature of the subject : it ought to be thin enough to work freely, and yet sufficiently firm to retain the position it is placed in without spreading. This composition never dries, and consequently can be removed from the plate, or its position altered at pleasure. The brushes requisite are those commonly used by artists,—sable, hog-hair, fitch, and camels'-hair, either in the common form or cut in different ways to facilitate the production of the effect intended, as is well understood by artists. Points of wood, ivory, and metal will be occasionally required, and also a dabber of silk or other material. The painting being finished by the artist, it is to

be slightly touched in the dark parts with plumbago (in fine powder), or other suitable material for making the surface conducting, with a soft pencil, and submitted to the electrotype process, which is now well understood, by which means a metal plate is produced capable of transferring to paper or other material a fac-simile of the original painting. If any of the tints should prove too dark, the burnisher, scraper, or other tool may be used, and any portion not sufficiently dark may be touched with the graver, or etched the same as an ordinary copper-plate. When it is desired to produce a washy texture, I prefer a composition as follows:—Mix equal parts of wax and ivory-black, ground with olive oil, and made thin with spirits of turpentine. This may be used with any of the brushes already mentioned. A soft brush containing plumbago, passed over the painting, will tend to harden the composition, and make the surface a conducting surface.

I will now describe the second part of my invention:—The required subject is painted on a darkened or black copper or other plate, with a white or light coloured material, so as to produce the effect intended by means of such brushes or tools, as will leave the composition in lines or dots capable of making an impression in the electro-tint plate sufficient so as not to come in contact with the printing-roller; whilst those parts of the darkened copper, which are left visible, either in lines or dots, will, when electrotyped, receive the ink from the roller, and, when printed from, transfer an impression to paper or other material. The composition used is made in the following manner:—Two parts by weight of sulphate of lead, two of lard, and one of wax, melted together and stirred till nearly cold. This composition is not likely to be too thick; a little olive-oil can, however, be used with it, if it should prove so; and if too thin, more of the sulphate may be added; the composition should be well ground before it is used. The brushes recommended

for this "surface electro-tint" are the cut brushes of different degrees of fineness, mentioned as being applicable to the first process, sable pencils in their common shape, points of ivory, &c., and an instrument with several projecting points, somewhat resembling a comb. After the outline of the subject has been made in any way, so as not easily to be obliterated, those parts of the plate, which are intended to be black, are left bare, the intermediate shades between black and white are obtained by painting with the cut brushes, which will leave lines or points of composition of considerable projection. Broad portions of light are obtained by heaping on the composition to the thickness of one-eighth of an inch or more, in proportion to the size of the masses of white. In those instances where a white back ground, or very large portion of white occurs, it is only necessary to raise a wall of the composition about one-eighth of an inch thick round the edge of the subject, as the copper, &c., beyond the wall can be protected by a sealing-wax, or other suitable varnish. Flat tints for flesh, back grounds, &c., can be formed by striking a fitch or other brush perpendicularly, so as to produce numberless projecting points, which make corresponding indentations on the deposit too deep to receive any ink from the roller. A beautiful "dragged" texture is produced by using the composition, thinned a little with spirits of turpentine, with a soft brush held in a slanting direction, and passed quickly over the surface: this leaves the composition in a series of raised dots on those parts of the surface over which the brush has passed. In this manner may a suitable conducting surface be prepared for obtaining an electrotype plate or surface using plumbago, or other suitable material to make the surface conducting, where the surface is covered with composition, as above explained. As it is sometimes necessary in printing from wood-blocks to lower the light parts, so also it is sometimes necessary in electrotype surfaces, according to this part

of my invention. I will, therefore, describe the means I practice for lowering the light parts, though other means may be used. I take a sheet of mill-board and fold it in the middle, so that the two flaps or sides may fold on each other without shifting; I then take a number of sheets of paper, according to the depth I wish the plate to be lowered, and affix them to one flap; I then trace on the upper sheet the outline of the parts to be lowered; I then, with a penknife, cut through all the sheets where the plate is to be most lowered, and only through a portion of them in other places, according to the depth required, taking care that the edges are cut on a bevel or slanting edge, and not a sudden or vertical one. The portions which have been cut out must now be rubbed over with paste or cement, and the other flap of mill-board shut on them, to which they will adhere: this is to be repeated until all the pieces cut out are taken from the hollows, and thus the parts cut out will project on the surface of one part of the mill-board, and when shut will exactly fit into the hollows cut from the sheet of paper resting on the other surface of mill-board; I then take a polished soft copper-plate, and place it between the flaps of mill-board in such manner that the plate will have the projecting surface produced by the cut out paper on one side, and the sheets of paper with the hollows on the other side; and I submit the whole to pressure, by which means the plate will be undulated in those places where the paper has been cut out, and to a degree depending on the depth to which the paper has been cut out; and as such lowering is according to the outline of the design, which is to be painted or produced on the plate, the lowering will be in the proper place for the design. The artist will now proceed in painting and producing the picture or design on the plate; and from this plate or surface an electro-tint surface is to be obtained, as before described. In some instances the drawing can be made on a flat ground, and the electrotpe block, intrusted to the wood-cut prover,

who would prepare it for the ordinary printing-press ; or these effects may be produced by other means.

Having thus described the nature of my invention, and the manner in which the same is to be performed, I would remark, that in addition to these electro-tint surfaces (whether printing by the ink being received in the sunken parts thereof, or when used for surface printing) producing impressions of a novel kind on paper or other material, of the original painting, such means of producing printing surfaces will be found particularly applicable in the printing of china, pottery-ware, music, maps, and portraits. And it only remains to be remarked, that in preparing the drawing or painted design on a suitable surface, and with a convenient composition, that care is to be observed that the surface of the composition should be made conducting by plumbago, or other suitable material, in order not to trust to the simple conducting properties of the surface on which the painting or drawing is executed, when it is a conducting surface ; for although fine lines or dots at intervals apart, made of various materials in a conducting surface, may have an electrotpe taken from the same, and which would have produced therein narrow hollow lines or indents for the lines or dots of the original plate, owing to the lines and dots being narrow and small, and surrounded by a conducting material ; yet, in executing a painting, varying in dark and light parts, and of shadows, and in the extent thereof, the various parts of the drawing or printing should be made conducting before taking what I have called electro-tint printing surfaces ; and although I have been particular in describing the means pursued by me in carrying out my invention, I do not confine myself thereto, provided the peculiar character of the invention be retained ; but what I claim is the mode herein described, of producing printing surfaces by painting or drawing with suitable composition, and obtaining electrotpe plates or other surfaces therefrom ; and I do also claim (in addition to their appli-

cation to other purposes) their application to the purposes of printing china, pottery-ware, music, maps, and portraits.—In witness whereof, &c.

EDWARD PALMER.

Enrolled December 12, 1841.

Specification of the Patent granted to WILLIAM THOMAS BERGER, of Upper Homerton, Hackney, in the County of Middlesex, Gentleman, for Improvements in the Manufacture of Starch.—Sealed June 28, 1841.

To all to whom these presents shall come, &c., &c.—My invention relates, first, to a mode of manufacturing starch from rice by the application of an alkaline salt, whereby the gluten is dissolved or freed so that the starch may be separated therefrom.

Secondly, to a mode of manufacturing starch by submitting grains of rice to soaking in water and fermenting processes.

Thirdly, my invention relates to a mode of manufacturing starch from rice, by the combined application of an alkaline salt with a process of fermentation.

Fourthly, my invention relates to a mode of blueing starch. And in order that my invention may be most fully understood, and readily carried into effect, I will proceed to describe the processes pursued by me.

Description of the Process of Manufacturing Starch from Rice by the application of an Alkaline Salt, in order to Separate the Gluten and Starch.

It will be desirable to state that various alkaline salts have the property of enabling the gluten and starch of rice to be separated; but those which I have found to be most suitable, both from their cheapness and general efficient action, are carbonate of soda, or carbonate of

potash (chloride of soda acts well, though that alkaline salt is too costly when compared with the prices of carbonate of soda or potash); the other soluble alkaline salts, which act more or less to produce the desired effect, by dissolving or freeing gluten, and thus facilitating the separation of the starch therefrom by precipitation, are all, I believe, too costly, even if they would act as well as carbonate of soda, or carbonate of potash: I will therefore confine my description to the use of carbonate of soda, which is the alkaline salt I commonly apply.

I take 112 lbs. of whole or unground rice, free from its outer bran or pellicle, and put it into a vessel and cover it with water, in order to its swelling and taking in all the moisture it will. After soaking two days, the water is to be drawn away by a tap, or by a plug-hole, at the bottom of the vessel; the rice is then to be reduced to a fine pulp or creamy state, by passing it with water through levigators (or by any other convenient means), straining it as it comes from the levigators through a sieve of about sixty holes or meshes to the inch (called a sixty-hole sieve), returning the "gruff," or coarse parts in the sieve through the levigators again and again through the sieve, until all has passed through the sieve: should more water have been used in causing the rice to pass through the levigators than will leave the bulk, thus ground, of the consistency of thick cream, then it will be well to allow the rice thus ground to subside, when the top clear water may be drawn off, and the bulk well stirred up. I then make a solution of carbonate of soda by putting into a vessel 7 lbs. of carbonate of soda, and add thereto $3\frac{1}{4}$ gallons of water, either hot or cold, and when thoroughly dissolved and cold, I add the solution to the rice, stirring well for half an hour, and then allow the matters to remain from 50 to 60 hours, stirring well once in every four hours. I then allow the matters to stand from 12 to 18 hours for depositing, when the top liquor, containing the gluten, is to be drawn off by means of a syphon; the re-

maining matters are then to be well stirred up, and another solution of carbonate of soda of the same strength and quantity added, stirring well every four hours till matters have been together 50 to 60 hours; they are then to be allowed to stand from 12 to 18 hours for depositing, as before, when the top liquor containing more of the gluten is to be drawn off by means of a syphon, the remaining matter is to be well stirred up, and reduced to quite a thin state by adding about 224 gallons of water. This mixture is now to be slowly and continuously pumped into a long vat (used sometimes by starch manufacturers for cleansing or separating the heavy refuse particles from wheat-starch when in the pulp or liquid state) having 3 or more compartments which allows the heaviest particles to subside in the first receiver or compartment; the liquor containing the starch flowing over the partition into the second compartment, will deposit more of the heavy particles, and so on until the liquor containing the starch comes from the vat free from all grit and refuse matter: a workman, after a short practice of this process, will readily judge how this process is proceeding, or he may ascertain how it is going on, by putting some of the liquor into a glass and allowing it to stand for a minute or two, when the grit or refuse matter will be seen to deposit at the bottom, if there be any, upon which the stream thrown by the pumps must be lessened, which will produce the desired effect. When the whole of the liquor has been thus pumped through the vat, I take the refuse matter from each compartment, and (if thought necessary) put upon it another solution of carbonate of soda of the same strength, and, as nearly as can be judged, the same proportions as used at first, allowing it to stand 24 hours; after which it is to be made as thin as before, with cold water, and pumped carefully through the vat. The fine liquors obtained, as above explained, containing the starch, are allowed to remain in vats or frames; in which they are received as they come from the separating

vat, until the starch is fully settled, when the waste waters are to be drawn off by a syphon, and the starch beat up, washed, strained, and finished in the usual way of manufacturing starch.

I would remark, that although I have been particular in describing the actual means pursued by me, and which I believe to be the best for the purpose; yet I do not think it necessary to confine the operation thereto, so long as the peculiar character of this part of my invention be retained, whereby rice is acted on by an alkaline salt, in order to dissolve or act upon gluten, and thus to obtain the separation of starch therefrom, as also from the other products of rice.

I will now proceed to describe the second part of my invention, which relates, as before stated, to a mode of manufacturing starch from grains of rice, by soaking and fermenting processes. In manufacturing starch from grain (generally wheat), it is the practice to grind the same before soaking, but owing to the brittleness of rice, it would be costly and prejudicial to grind the same to a fine flour, as practised with wheat; and I have discovered that the requisite fermentation may be obtained to the grains of rice without such previous grinding to a flour or powder; and I accomplish such fermentation, either wholly by soaking, or by soaking combined with what I call a malting process, in which, however, it may be stated, that no germination I believe takes place.

Description of Process for Manufacturing Starch from Rice, by Soaking Grains of Rice combined with a Process which I call Malting.

I put any given quantity of the grains of rice, free from the outer bran or pellicle, into a vessel, and add sufficient water to cover it about 6 to 9 inches, and allow it to remain in this state for about 14 days, when the water is to be drawn away by a tap or plug-hole at the bottom of the vessel. The rice is now to undergo the process I have

called malting ; it is taken out and spread 6 to 9 inches deep upon a perfectly clean wooden floor, or racks fitted up for the purpose, taking great care to turn it once or twice a day, or more often, should there be any signs of the rice heating. It is to remain in this state until it becomes soft enough to crush easily between the thumb and finger, which is generally brought about after laying from 4 to 6 days. It is then to be gathered up and reduced to a pulp, by levigating, or other convenient means. Should the rice have become dry or nearly so, I find it advantageous to put it, over night, into a vat to soak with water, as it greatly facilitates the reducing it by levigating ; I then pass it through a sieve as it comes from the mill, and keep returning the gruff or heavy particles through the mill and sieve, until it has all passed through the sieve, when I reduce the pulp by adding about 224 gallons of water to every 112 pounds of rice, and when stirred well, I pump it through a vat, having compartments as before described in the first part of my invention, taking out the heavy particles from the several compartments of the vat, and returning them (if judged needful) to the levigating process ; it is then to be made thin as before, and pumped through the vat, when the refuse matters may be taken out from the compartments. The liquor containing the starch, is to be allowed to remain in the respective vats or frames which receive it as it comes from the separating vat, until the starch is fully settled, when the waste water is to be drawn off, and any brown matter removed from the surface of the starch. The starch is now to be beat or stirred up, strained, and finished in the usual way of manufacturing starch. Or in place of using what I have called the malting process, in combination with the soaking process, I sometimes obtain the requisite fermentation when soaking grains of rice. I put any given quantity of grains of rice, free from its outer bran or pellicle, into a vessel, and add sufficient quantity of water to cover it about 9 to 12 inches. It is

to be allowed to remain for 5 or 6 weeks, when the gluten will have become decomposed, and held, or partly held in solution, by its spontaneous fermentation; at the expiration of which time, the thick mucilaginous matter containing the gluten and other products, is to be drawn away by means of a tap at the bottom of the vessel. The rice, which will be soft, may now be readily brought to a pasty or pulpy state, by passing through a levigating mill and sieve as before described; or by other convenient means, until it is all reduced to a fine pulp. To this pulp, add about 224 gallons of water, to every 112 pounds of rice, the same are to be stirred well, and pumped through the separating vat, as before mentioned, and the starch is to be finished in the usual way of starch manufacture.

I would remark, that if it should be found that the colour of the starch (produced by either of the foregoing processes) be not quite so good or pure as desired, then I make a solution of chloride of lime, by taking four pounds of chloride of lime, and adding 24 gallons of water, stirring it well for a quarter of an hour; it is then allowed to settle till the lime has gone to the bottom of the vessel. I now draw off the clear liquor, and add the same to 112 pounds of rice, stirring the mixture well for two hours and allow it to stand for 12 hours, when the clear liquor may be drawn off, and the starch stirred up, washed, strained, and finished in the usual way. I also find a solution of chloride of soda to have the same effect.

I would remark in respect to this part of my invention, that although I have been particular in describing the processes pursued by me, for separating the starch from the other products, by the fermentation of grains of rice, yet I do not confine myself thereto; this part of my invention relating to the means of acting on the gluten of grains of rice by fermentation, and obtaining the pulpy materials, and then to separate the starch by suitable means of precipitation.

I will now describe the third part of my invention, which as before stated, relates to a mode of manufacturing starch from rice, by the combined use of an alkaline salt, and a process of fermentation ; and I would here state, that I prefer this conjoined process, and would recommend it in preference to the others herein described, because I believe a better quality of starch may be made thereby.

Description of the Process.

I take rice after it has been fermented and brought to a pulpy state, under or by either process as above described, and add a solution of an alkaline salt, I usually employ carbonate of soda, made after the same proportions as before explained, and add the same to every 112 pounds of rice contained in the pulp, the mixture being well stirred for half an hour, and then allowed to remain from 50 to 60 hours, stirring every 4 hours ; it is then left without stirring for 12 to 18 hours for depositing, when the top dis-coloured liquor is to be drawn off. The bulk is now to be well stirred up, and made thin with 224 gallons of water to every 112 pounds of rice ; then pumped through the separating vat, as before described, and finished in the usual way.

Note.—It should be stated, that if the product of any of the above processes, after washing, indicate spontaneous fermentation, add one ounce of sulphuric-acid diluted in 1 gallon of water to every 112 pounds of rice.

I will now describe the fourth part of my invention, which relates to a mode of blueing starch, whether made from rice or other materials.

It is well known that in colouring starch as heretofore practised, smalts are used.

Now the object of this part of my invention, is to apply what is called "Artificial Ultramarine ;" which is a colour well known in commerce and the arts, and can be readily purchased. In using this material, care is to be observed that any acid which may exist in the starch, (when about

to colour the same) is to be saturated or neutralized by an alkali, and the ordinary test-paper will indicate when the acid is neutralized, and in order to ensure this to be the case, I prefer the alkali to be slightly in excess of saturating the acid; the starch manufacturer will then colour with the artificial ultramarine to the extent desired.

Having thus described the nature of my invention and the best means I am acquainted with for performing the same, I wish it to be understood, that what I claim, is, first, the above mode of manufacturing starch from rice, by the application of an alkaline salt, whereby the glutên and starch of rice may be separated as above described.

Secondly, I claim the mode of manufacturing starch from rice, by submitting grains of rice to soaking in water and fermenting processes as above described.

Thirdly, I claim the mode of manufacturing starch from rice, by the combined application of an alkaline salt and a process of fermentation as above described.

And fourthly, I claim the mode of colouring starch by the application of artificial ultramarine, as herein described.—In witness whereof, &c.

WILLIAM THOMAS BERGER.

Enrolled December 23, 1841.

LAW REPORTS OF PATENT CASES.

*Vice-Chancellors' Courts, Thursday, Dec. 16, 1841.**Before Sir L. SHADWELL.***MUNTZ v. VIVIAN AND WALKER.**

THIS was a motion on behalf of Mr. George Frederick Muntz, M. P. for Birmingham, for an injunction to restrain the defendants, who represented "Harford's Brass Battery Company," at Bristol, from counterfeiting "an improved manufacture of metal plates for sheathing the bottom of ships and other vessels," for which the plaintiff obtained a patent in 1832. The invention was stated by the specification to consist in making the plates for sheathing of an alloy of zinc and copper, in such proportions, as while it enabled the manufacturer to roll the compound into plates fit for sheathing at a red heat, so that the plates were less difficult to work, it also rendered the sheathing less liable to oxydation, and more durable than the ordinary copper sheathing, though at the same time it oxidized sufficiently to keep the bottom of the vessel clean. For this purpose the patentee took what is termed the "best selected copper" and "foreign zinc," and melted them together in any proportion between 50 per cent. of copper, and 50 per cent. of zinc, and 63 of copper, and 37 of zinc, both of which extremes, and all intermediate proportions, would roll at a red heat; but, inasmuch as too large a proportion of copper increased the difficulty of working, and too large a quantity of zinc rendered the metal too hard when cold, the alloy was preferred to consist of about 60 per cent. of copper and 40 of zinc. This compound was cast into ingots of any convenient weight, and then heated to a red heat, and rolled in the same method that copper was rolled hot, taking care not to overheat the metal so as to produce fusion, and then it was put through the roller after the heat had passed off, so as to prevent its splitting. The

sheets after finishing were well annealed and cleaned with a mixture of sulphuric acid and water. The specification admitted that the alloy might be compounded in a different way, such as by cementing calamine and copper in certain proportions, and by employing brass rolled out, but it rendered the application of red heat necessary in these cases, and the expense was stated to be infinitely greater.

The defendants admitted they had made use of a compound the proportions of which were within the limits of the plaintiff's specification, but had not employed red heat in the process. This mode of manufacture they stated had been generally known and made use of by themselves before the date of the plaintiff's patent, and therefore it was defective in point of novelty; and the mere application of it to the sheathing of ships was not such a new use of a common and known principle as the court would protect.

The question, therefore, chiefly depending on the novelty and utility of the invention, a number of affidavits of eminent persons in the shipping trade were read in support of the validity of the patent in these particulars, including one by Bayley, the shipwright and surveyor of Lloyd's. It was also relied on by the plaintiff, as a proof that the combination used by the defendants had been taken from the plaintiff's patent, that their old and imperfect method of manufacturing sheathing for ships' bottoms was varied, and the principle of the plaintiff's invention adopted, immediately after the patent was granted.

The defendants' case mainly rested on the evidence of Mr. Herapath, an eminent chymist at Bristol, and Mr. Mortimer, a brass founder, at Keynsham, Somerset, who stated they had made several experiments at the request of the defendants upon the method described in the specification, and found that in each of them, where the rolling took place when the metal was hot, it was invariably found to split at the edges; and as it was

shewn by these gentlemen, in connexion with these experiments, that the combination of the proportions in the plaintiff's specification was to be found as long ago as 1788, in *Bishop Watson's Essays*, the *Encyclopædia Britannica*, in 1810, *Chamber's Dictionary*, *Thomson's Chemistry*, and other well-known works on the subject, to have been in general use, and applied to all sorts of vessels and door plates; and as, moreover, the only novelty was the use of heat, which was found to fail, the defendants insisted they were fully entitled to use the combination of the proportions they had used when the metal was rolled in a cold state, whether it came within the terms of the plaintiff's specification or not.

Mr. Muntz stated in affidavit in reply, that in the experiments made by Mr. Herapath, an allowance of from 1½ to 2 per cent. had not been made in the zinc used, and hence the experiments, which did not thus come within his limits, had failed.

Mr. Bethell, Mr. Rotch, and Mr. Hetherington moved for the injunction, and Mr. Richards and Mr. Osborn were counsel for the defendants.

The *Vice-Chancellor* said he should refrain from giving any opinion on the validity of the plaintiff's patent, because there had been such a possession of apparent right that the court would interfere, if a clear infraction had been made out, by putting the plaintiff to bring an action at law, that the validity of the patent might be determined. But he doubted very much whether the use of heat in rolling the metal was not made part of the thing for which the patent was granted. The defendants represented that whatever proportions were used when the metal was rolled hot, it was invariably found to split. Then they stated a variety of experiments to shew their own course was the best, and that they never once in the course of 11 years, except when making these experiments, rolled the combination in a state of heat. If this were so, the question was, whether there had been any

violation of the patent, and also whether the method in which the sheathing was required to be made by the plaintiff was not when the metal was hot. His Honour then examined the language of the specification, and said his mind was strongly impressed with this, that wherever the plaintiff described the manner in which the invention was to be performed, by means of which the compound metallic substance was to be fabricated, "heat" or "red heat" was always a necessary ingredient. That being so, the alledged infraction came to this, that the defendants had used the very proportions of the plaintiff, but had taken care heat should not be the ingredient employed when it came to be rolled. He doubted, therefore, whether what the defendants had done was a sufficient case of invasion in which the court could interfere, and was of opinion that all he could do was not to make an order refusing the motion, but to let it stand over, and direct the plaintiff forthwith to bring such action as he shall be advised, to try the validity of the patent, giving both parties liberty to apply to the court in the mean time.

NOTICE OF EXPIRED PATENTS.

(Continued from page 315, vol. 16.)

JOSHUA TAYLOR BEALE, of Church Lane, Whitechapel, London, Engineer, and GEORGE RICHARDSON PORTER, of Old Broad Street, London, Merchant, for a new mode of communicating heat for various purposes.—Sealed January 19, 1828.—(*For copy of specification, see Repertory, Vol. 8, third series, p. 141.*)

WILLIAM PARAVALL, of Knightsbridge, in the County of Middlesex, Veterinary Surgeon, for improvements in the construction and application of shoes without nails to the feet of horses and certain other animals.—Sealed January 19, 1828.

GEORGE JACKSON, of St. Andrew, Dublin, Attorney at Law, for improvements in machinery for propelling boats and other vessels, which improvements are also applicable to water-wheels and other purposes.—Sealed January 19, 1828.

JOHN WEISS, of the Strand, London, Surgical Instrument Maker,

for improvements on instruments for bleeding horses and other animals.—Sealed January 26, 1828.

AUGUSTUS APPELGATH, in Crayford, Kent, Printer, for improvements in block printing.—Sealed January 26, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 463.*)

DONALD CURRIE, of Regent Street, London, Esquire, for a method of preserving grain, and other vegetable and animal substances and liquids. Communicated by a foreigner residing abroad.—Sealed January 31, 1828.

WILLIAM NAIRN, of Danc Street, Edinburgh, Mason, for a new or improved method or methods of propelling vessels through or on the water, by the aid of steam or other mechanical force.—Sealed February 5, 1828.—(*For copy of specification, see Repertory, Vol. 7, third series, p. 321.*)

CALEB HITCH, the younger, of Ware, in the county of Hertford, Brick Maker, for an improved mall, for building purposes.—Sealed February 21, 1828.

GEORGE DICKINSON, of Buckland Mill, near Dover, Kent, Paper Manufacturer, for an improvement or improvements in making paper by machinery.—Sealed February 21, 1828.

ANGELO BENEDETTO VENTURA, of Cirencester Place, Fitzroy Square, Middlesex, Professor of Music, for improvements on the harp, lute, and Spanish guitar.—Sealed February 21, 1828.

THOMAS OTWAY, of Walsall, Staffordshire, Iron Master, for his expedient for stopping horses when running away with riders or in carriages.—Sealed February 21, 1828.

DAVID BENTLEY, of Pendleton, Lancashire, Bleacher, for an improved method of bleaching, and improvements in machinery adapted to bleaching and finishing linen or cotton yarn, and goods.—Sealed February 21, 1828.

WILLIAM BRUNTON, of Leadenhall Street, London, Civil Engineer, for certain improvements on furnaces for the calcination, sublimation, or evaporation of ores, metals, and other substances.—Sealed February 21, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 159.*)

(*To be continued.*)

PATENTS GRANTED FOR SCOTLAND,

From November 10, 1841, to January 18, 1842.

MARTYN JOHN ROBERTS, of Bryncaeran, in the county of Caermarthen, Gentleman, and WILLIAM BROWN of the

city of Glasgow, Merchant, for improvements in the process of dyeing various matters, whether the raw material of wool, silk, flax, hemp, cotton, or other similar fibrous substances, or the same substances in any stage of manufacture; and in preparation of pigments or painters' colors.—Sealed November 10, 1841..

JOHN ANNES, of Plymouth, in the county of Devon, Painter, for a new and improved method of making paint from materials not before used for that purpose.—Sealed November 12, 1841.

WILLIAM PALMER, of Sutton Street, Clerkenwell, in the county of Middlesex, Manufacturer, for improvements in the manufacture of candles. Partly communicated by a foreigner residing abroad.—Sealed November 17, 1841.

GEORGE BENT OLLIVANT, and ADAM HOWARD, of Manchester, Mill-Wrights, for certain improvements in cylindrical printing machinery, for printing calicoes and other fabrics, and the apparatus connected therewith, which is also applicable to other useful purposes.—Sealed November 17, 1841.

JOHN STEWARD, of Wolverhampton, in the county of Stafford, Esquire, for certain improvements in the construction of pianofortes.—Sealed November 22, 1841.

GEORGE LOWE, of Finsbury Circus, in the city of London, Civil Engineer, for improved methods of supplying gas under certain circumstances, and of improving its purity and illuminating power.—Sealed November 24, 1841.

WILLIAM EDWARD NEWTON, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, Civil Engineer, for certain improvements in the production of ammonia. Communicated by a foreigner residing abroad.—Sealed December 1, 1841.

JAMES BALDERSTON, of Paisley, in the county of Renfrew, Manufacturer, for certain improvements in machinery or apparatus for doubling, twisting, twining,
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and finishing cotton and other fibrous substances.—Sealed December 7, 1841.

JAMES COLMAN, of Stoke, Holy Cross, in the county of Norfolk, Starch Manufacturer, for improvements in the manufacture of starch.—Sealed December 10, 1841.

ALEXANDER PARKES, of Birmingham, in the county of Warwick, Artist, for certain improvements in the production of works of art in metal by electric deposition.—Sealed December 10, 1841.

WILLIAM IRVING, of Princes Street, Rotherhithe, in the county of Surrey, Gentleman, for improvements in the manufacture of bricks and tiles.—Sealed December 10, 1841.

GEORGE HICKES, of Huddersfield, in the county of York, Agent, for an improved machine for cleaning or freeing wool and other fibrous materials, of burs and other extraneous substances.—Sealed December 10, 1841.

JOSEPH NEEDHAM TAYLER, of Devonport, in the county of Devon, a Post-Captain in Her Majesty's Navy, for a certain method or certain methods of abating or lessening the shock or force of the waves of the ocean, lakes, or rivers, and of reducing them to the comparatively harmless state known by the term, "broken water," and thereby preventing the injury done to, and increasing the durability of, breakwaters, mole-heads, piers, fortifications, lighthouses, docks, wharfs, landing-places, embankments, bridges, or pontoon bridges, and also of adding to the security and defence of harbours, roadsteads, anchorages, and other places exposed to the violent action of the waves.—Sealed December 11, 1841.

ROBERT HOLT, of Manchester, in the county of Lancaster, Cotton Spinner, and ROBINSON JACKSON, of Manchester, aforesaid, Engineer, for certain improvements in machinery or apparatus for the production of rotary motion for obtaining mechanical power, which said im-

provements are also applicable for raising and impelling fluids.—Sealed December 11, 1841.

WILLIAM HILL DARKER, senior, and **WILLIAM HILL DARKER**, junior, both of Lambeth, in the county of Surrey, Engineer, and **WILLIAM WOOD**, of Wilton, in the county of Wilts, Carpet Manufacturer, for certain improvements in looms for weaving.—Sealed December 14, 1841.

ARCHIBALD TEMPLETON, of Lancaster, in the county of Lancaster, Silk Spinner, for a new or improved method of preparing for spinning silk and other fibrous materials.—Sealed December 16, 1841.

JAMES COLLEY MARCH, of Barnstable, in the county of Devon, Surgeon, for certain improved means of producing heat from the combustion of certain kinds of fuel.—Sealed December 16, 1841.

CHRISTOPHER DUMONT, of Mentz, in the kingdom of Germany, but now residing at Mark lane, in the city of London, Gentleman, for improvements in the manufacture of metallic letters, figures, and other devices. Communicated by a foreigner residing abroad.—Sealed December 16, 1841.

MORRIS WEST RUTHVEN, of Rotherham, in the county of York, Engineer, for a new mode of increasing the power of certain media when acted upon by rotary fans or other similar apparatus.—Sealed December 16, 1841.

HENRY AUGUSTUS WELLS, of Regent Street, in the county of Middlesex, Gentleman, for improvements in machinery for driving piles. Communicated by a foreigner residing abroad.—Sealed December 17, 1841.

HENRY BOOTH, of Liverpool, Esquire, for improvements in the method of propelling vessels through water.—Sealed December 17, 1841.

JOHN HALL, of Breezes Hill, Ratcliffe Highway, in the county of Middlesex, Sugar Refiner, for improvements in the construction of boilers for generating steam, and in the application of steam to mechanical power.—Sealed December 17, 1841.

HENRY BROWNE, of Codnor Park Iron Works, in the county of Derby, Iron Manufacturer, for improvements in the manufacture of steel.—Sealed December 18, 1841.

WILLIAM NEWTON, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, Civil Engineer, for certain improvements in engines to be worked by gas, vapour, or steam. Communicated by a foreigner residing abroad.—Sealed December 20, 1841.

JOHN JUCKES, of Lewisham, in county of Kent, Gentleman, for improvements in furnaces or fire-places.—Sealed December 28, 1841.

MONTAGU MAC DONOUGH, of Saint Albans's Place, Middlesex, Gentleman, for improvements in spindle-flyers and bobbins for spinning, roving, twisting, and reeling all sorts of fibrous or textile substances, and in the application or adaptation of either or all of them to machinery for the same purposes. Communicated by a foreigner residing abroad.—Sealed January 4, 1842.

THOMAS JOSEPH DITCHBURN, of Orchard House, Blackwall, in the county of Middlesex, Ship Builder, for certain improvements in ship building, some or all which are applicable to steam-boats and boats and vessels of all descriptions.—Sealed January 6, 1842.

MOSES POOLE, of Lincolns Inn, in the county of Middlesex, Gentleman, for improvements in preparing matters to be consumed in obtaining light, and in the construction of burners for burning the same. Communicated by a foreigner residing abroad.—Sealed January 7, 1842.

WILLIAM PETRIE, of Croydon, in the county of Surrey, Gentleman, for a mode of obtaining a moving power by means of voltaic electricity applicable to engines, and other cases where a moving power is required.—Sealed January 7, 1842.

JAMES TAYLOR, Junior, Smith and Engineer, Turner's Court, Glasgow, for a self-acting machine for driving piles and stakes, and for other such purposes, to be wrought by steam or other power.—Sealed January 10, 1842.

JOHN GEORGE BODMER, of Manchester, in the county of Lancaster, Engineer, for certain improvements in the construction of screwing stocks, taps, and dies, and certain other tools or apparatus or machinery for cutting and working in metals.—Sealed January 13, 1842.

WILLIAM PETRIE, of Croydon, in the county of Surrey, Gentleman, for improvements in obtaining mechanical power.—Sealed January 13, 1842.

ALPHONSE RENE LE MIRE DE NORMANDY, of Red Cross Square, in the city of London, Doctor of Medicine, for certain improvements in the manufacture of soap.—Sealed January 13, 1842.

HENRY HOUGH WATSON, of Bolton-le-Moors, in the county of Lancaster, Consulting Chemist, for certain improvements in dressing, stiffening, and finishing cotton and other fibrous substances, and textile and other fabrics, part or parts of which improvements are applicable to the manufacture of paper, and also to some other processes or operations connected with printing calicoes and other goods.—Sealed January 18, 1842.

LIST OF NEW PATENTS.

WILLIAM ROBINSON KETTLE, of Waterloo Street, Birmingham, Accountant, **BENJAMIN WAKEFIELD**, of Ryland Street North, Birmingham, Civil Engineer, and **WILLIAM CROSER**, of Cumberland Street, Birmingham, aforesaid, Screw Manufacturer, for an improved bolt for building and other purposes.—Sealed December 24, 1841.—(*Six months.*)

MONTAGU MACDONOGH, of Saint Alban's Place, Middlesex, Gentleman, for improvements in spindles, flyers, and bobbins, for spinning, twisting, and reeling all sorts of fibrous or textile substances, and in the application or adaption of either or all of them to machinery for the same purposes. Communicated by a foreigner residing abroad.—Sealed January 6, 1842.—(*Six months.*)

EDWARD HALL, of Dartford, Civil Engineer, for an improved steam-boiler.—Sealed January 11, 1842.—(*Six months.*)

SAMUEL HEARNE LE PETIT, of Saint Pancras Place, Saint Pancras Road; for certain improvements in the manufacture and supply of gas. Communicated by a foreigner residing abroad.—Sealed January 11, 1842.—(*Six months.*)

JAMES CHESTERMAN, of Sheffield, Mechanist, and JOHN BOTTOM, of the same place, Mechanist, for certain improvements in tapes for measuring, and in the boxes for containing the same.—Sealed January 11, 1842.—(*Six months.*)

CHARLES WYE WILLIAMS, of Liverpool, Gentlemen, for certain improvements in the construction of furnaces, and effecting combustion of the inflammable gases from coal.—Sealed January 11, 1842.—(*Six months.*)

JOHN TRUSAHAR JEFFREE, of Blackwall, Engineer, for certain improvements in the lifting and forcing water and other fluids, parts of which improvements are applicable to steam-engines.—Sealed January 11, 1842.—(*Six months.*)

RICHARD DOVER CHATTERTON, of Derby, for certain improvements in propelling.—Sealed January 11, 1842.—(*Six months.*)

JAMES TONS, of Newcastle-upon-Tyne, Gentleman, for improvements in smelting copper ores.—Sealed January 13, 1842.—(*Six months.*)

JULIUS BORDIER, of Austin Friars, Merchant, for certain improvements in preparing skins and hides, and in converting them into leather.—Sealed January 13, 1842.—(*Six months.*)

CALEB BEDELLS, of Leicester, Manufacturer, and JOSEPH BEDELLS, of the same place, for improvements in the manufacture of elastic fabrics, and articles of elastic fabrics.—Sealed January 13, 1842.—(*Six months.*)

JOSEPH BARNES, of Church, near Accrington, Lanca-

cashire, Manufacturing Chemist, for certain improvements in the working of steam-engines.—Sealed January 13, 1842.—(*Six months.*)

HENRY WATERTON, of Winford Lodge, Chester, Esquire, for improvements in the manufacture of salt.—Sealed January 13, 1842.—(*Six months.*)

JOHN JEREMIAH RUBEN, of Birmingham, Umbrella and Parasol Furniture Manufacturer, for improvements in the manufacture of a certain part of umbrella and parasol furniture.—Sealed January 13, 1842.—(*Six months.*)

MOSES POOLE, of Lincoln's Inn, Gentleman, for improvements in the construction of locks. Communicated by a foreigner residing abroad.—Sealed January 15, 1842.—(*Six months.*)

JOHN THACKERAY, of Nottingham, Lace Thread Manufacturer, for improvements in the process of preparing and gasing thread or yarn.—Sealed January 15, 1842.—(*Six months.*)

THOMAS LAMBERT, of Regent's Park, Musical Instrument Maker, for improvements in the action of cabinet piano-fortes.—Sealed January 15, 1842.—(*Six months.*)

EDWARD PALMER, of Newgate Street, Philosophical Instrument Maker, for improvements in producing printing and embossing surfaces.—Sealed January 15, 1842.—(*Six months.*)

JAMES COLK, of Youl's Place, Old Kent Road, Brush Manufacturer, for certain improvements in the construction of brushes.—Sealed January 15, 1842.—(*Six months.*)

CORNELIUS WARD, of Great Tichfield Street, Musical Instrument Maker, for improvements in flutes.—Sealed January 18, 1842.—(*Six months.*)

WILLIAM TINDALL, of Cornhill, Ship Owner, for a new and improved method of extracting or manufacturing from a certain vegetable substance certain materials applicable to the purposes of affording light and other uses.—Sealed January 19, 1842.—(*Six months.*)

ANTOINE MERTENS, of the London Coffee House,

Publisher, for improvements in covering surfaces with wood. Communicated by a foreigner residing abroad.—Sealed January 22, 1842.—(*Six months.*)

WILLIAM BAKER, of Grosvenor Street, Grosvenor Square, Surgeon, for certain improvements in the manufacture of boots and shoes.—Sealed January 27, 1842.—(*Six months.*)

JOHN JAMES BAGGALY, of Sheffield, Engraver, for certain improvements in making metallic dies and plates for stamping, pressing, or embossing.—Sealed January 27, 1842.—(*Six months.*)

ANDREW KURTZ, of Liverpool, Manufacturing Chemist, for certain improvements in the manufacture of artificial fuel.—Sealed January 27, 1842.—(*Six months.*)

FRANCIS MARSTON, of Aston, in the county of Salop, Esquire, for improvements in apparatus for making calculations.—Sealed January 27, 1842.—(*Six months.*)

SAMUEL MASON, of Northampton, Merchant, for improvements in clogs, part of which improvements is applicable to shoes and boots.—Sealed January 27, 1842.—(*Six months.*)

GOTTLIEB BOCCIUS, of the New Road, Shepherd's Bush, Gentleman, for certain improvements in gas, and on the methods in use, or burners for the combustion of gas.—Sealed January 27, 1842.—(*Six months.*)

WILLIAM and JOHN GALLOWAY, and JOSEPH HALEY, of Manchester, Engineers, for certain improvements in machinery for cutting, punching, and compressing metals.—Sealed January 27, 1842.—(*Six months.*)

PIERRE JOURNET, of Dean Street, Soho, Engineer, for improvements in steam-engines. Communicated by a foreigner residing abroad.—Sealed January 27, 1842.—(*Six months.*)

HENRY BENJAMIN, of Saint Mary at Hill, Fish Factor, and HENRY GRAFTON, of Chancery Lane, Philosophical Instrument Maker and Machinist, for certain improvements in preserving animal and vegetable matters.—Sealed January 27, 1842.—(*Six months.*)

THE
REPERTORY
OF
PATENT INVENTIONS.

No. XCIX. NEW SERIES.—MARCH, 1842.

Specification of the Patent granted to JOHN BAPTIST FRIED WILHELM HEIMANN, of Ludgate Hill, in the City of London, Merchant, for Improvements in the Manufacture of Ropes and Cables.—Scaled March 8, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—
My invention has reference to the machinery and methods employed in the manufacture of wire ropes and cables; and in order to give the best information in my power, I will proceed to explain the drawings hereunto annexed.

● *Description of the Drawings.*

Fig. I, is a front and side view of a tackle-board, through the centre of which is passed an iron axis furnished with a hook, *a*, at one end, and a crank-handle at the other.

Fig. II, shews a front and side view of a tackle-board, in the centre of which a hole, *b*, is bored, and round this centre hole, six other holes, *c, c, c*, are bored at equal dis-

tances in a circle of twenty inches diameter. Behind each hole is placed a pulley, *d*, on an axis, in such manner that the upper part may be level with the corresponding hole, *c*. Through each hole, *c*, and over the corresponding pulley, *d*, a cord is passed, furnished at the end in front of the board with a swivel, *e*, and at the other with a strong hook, to which a weight, *f*, can be attached.

Fig. III., 1, shews a single rest formed for six wires and a core, and consists of an upright stake of wood, *g*, fixed to a post, with three cross bars, *h*, at right angles. At the extremities of each of these cross bars, and in the centre of the longest bar, hooks or open rings are placed in a circle of twenty inches diameter. The perpendicular stake may be formed of two pieces joined together by a hinge at *i*, and properly secured, in order that the whole rest may be let down when desired.

Fig. III., 1, 2, 3, is a combination of three rests forming together six circles, each of twenty inches diameter, and placed in such manner that each centre ring is equidistant from the other, in a circle of four feet four inches diameter.

Fig. IV., shews a "top," with six equidistant grooves or scores, with a perforation through the centre, it having handles at both sides.

Fig. V. shews a view of two boards, each of which is perforated with six holes in a circle of twenty inches diameter. Through each of the holes in the board, 4, is passed an axis furnished at one end with a hook, and at the other with a handle, as shewn at 5. These handles are passed through the corresponding holes in the board, 6, by which a uniform motion is given to the hooks.

Fig. VI., 7, 8, 9, shews a "jack," consisting of six pinions in a circle of four feet four inches diameter, in connexion with a cog-wheel in the centre; equal motion is given to the hooks attached to the pinions, by means of an axis and handle connected either with the centre wheel, or with one of the pinions; the pinions must be

so arranged that they can be moved back on their axes, so as to cut off their communication with the cog-wheel.

Fig. VII., is a tackle-board with a hole in the centre, through which is passed an axis with a hook and handle, as described in fig. I., which forms the centre of a circle four feet four inches in diameter, pierced at equal distances with six holes, each of which again forms the centre of a circle of twenty inches diameter, also pierced with six holes at equal distances; through each of these forty-two holes is passed a cord, furnished with a swivel and hook, and behind each hole is fixed a pulley as described in fig. II.

Fig. VIII. No. 10, the front view, and No. 11, a view as seen from above, of a combination of six "tops," (fig. IV.) placed at equal distances in a circle of four feet four inches diameter, in which position they are retained by means of the three flat iron bars, *l, l, l*, which are passed through the six tops, in such manner as not to touch either of the six grooves or scores on the external surface, or the perforation in the centre of each top, and by the other three perpendicular bars, *m, m, m*, the whole being fastened by wedges, *n, n, n*.

Fig. IX., shews a front and side view of a drum, and also longitudinal and horizontal sections of part of a shaft fixed firmly in the middle of a strong frame, and in a straight line, one behind the other, are two perpendicular posts, *o, o*, fitted for the reception of the bearings of a square iron shaft, which must project from both sides of the posts, *o, o*. One end of the shaft is cylindrical at *o, 1, 2, 3*, for a length of two feet five inches in a machine, where the proportions of the drawing are retained, which cylindrical part includes the projection which is twelve inches long, the bearings of the shaft, and that part next behind the bearings; such cylindrical end of the shaft being in three parts, the moveable upper portions, *o^a, o^b*, being hinged to each other at *p*, and one of them to the

shaft at p^1 . Through this cylindrical portion of the shaft is formed a circular channel two inches in diameter, one half in the moveable portions, o^2 , o^3 , and the other in the main shaft, o^1 , commencing in the centre of the line formed by the cut in the shaft, and proceeding in a horizontal but curved direction till it leaves the shaft at q , behind the first post. The ropes are to be held in the projecting part of the shaft, and in order to effect this for ropes of different diameters, the channel in the lower part of the projection, for a distance of nine inches from the point, is enlarged to three inches in front, increasing gradually to three and a half inches at the back, in the shape of the half of a regular octagon. The channel, in the upper or divided portion of the projection is also slightly enlarged for a distance of nine inches, gradually increasing in size toward the back; this enlargement of the channel is intended for the reception of filling pieces, the lower piece having angular external surfaces, which fit the angular internal surfaces of the channel in the lower portion of the shaft; such filling pieces being grooved suitably for receiving and holding the rope to be made. The divided portion of the shaft is fitted with metal hoops or straps and screws, by which the divided parts are fixed firmly to the main shaft in their exact relative positions, and the rope itself held whilst being laid. The motive power is applied to the end of the shaft projecting beyond the hindmost post, and a large drum is fitted upon that part of the shaft that is between the two posts.

Fig. X., shews a front and side view of a machine, being a combination of six shafts and drums, as described in fig. IX., the parts being smaller, which are fixed upon a frame in two rows in such a manner, that the points of all six shafts are in a circle of four feet four inches diameter, whilst the points of the three shafts in each row describe an equilateral triangle. To the ends of all six shafts that project beyond the hindmost posts, pinions

are fitted, each set of three of which are in connexion with one of two cog-wheels fitted upon a main shaft, passing through the centre of the circle, in the circumference of which the points of the six shafts are placed. The motive power is applied to the end of this shaft, and by means of the two cog-wheels an equal motion is given to the six smaller shafts. These six shafts must be sufficiently long to admit of the pinions being moved back, and being put out of communication with the cog-wheel, so that any one or more of the shafts can be separately put in motion. The proportions of the machines, IX., and X., are regulated by the length and weight of the ropes to be manufactured, which will also determine whether the frames or sledges on which the machines are fixed, are to move on the ground, or on a wooden or iron tram way, &c. with or without wheels. The motive power may be applied either by hand or by a steam-engine, &c., as may be convenient.

In manufacturing wire ropes with the machinery, above described, I proceed in the following manner : fig. I., is fixed at one end of the rope-walk to a common rope-maker's sledge, weighted in proportion to the length and size of the rope to be made, as is well understood by rope-makers ; such sledge being prevented from moving from its position. Fig. II. is attached to posts at the other end of the walk ; and at intervals along the whole length of the walk the rests, fig. III., are attached to posts fixed into the ground for that purpose, in such manner, that the hook of fig. I. corresponds with the centre hole of fig. II., and with the centres of fig. III., and consequently the remaining six holes in fig. II., will correspond with the six rings at the extremities of the cross-bars of fig. III. Six wires are now drawn out to the requisite length in proportion to the rope to be made, and passed through the six rings at the extremities of the cross-bars of fig. III. When wire cannot be procured of sufficient

length, several pieces may be joined together either by brazing or welding, when large enough, or by twisting the ends together for a short distance, care being taken that such joinings in the several wires do not come too near to each other in any part of the strand. In drawing out the wires it is advisable to pass them alternately through a series of nails or pins projecting from a suitable board, whereby they are straightened, as is well understood. One end of each wire is attached to the hook, *a*, of fig. I., and the other ends respectively to the six swivels, *e, e, e*, depending in a circle from fig. II., and they are drawn to an even tension by means of weights attached to the other ends of the cords, passing through the holes and over the pulleys of fig. II., and the cords to the swivels are then firmly fixed in the holes by means of wooden wedges or pins. The top, fig. IV., is then placed between the wires, as close as possible to the hook, *a*, fig. I., in such manner that one wire lies in each of the grooves. The end of a seventh wire or of a cord of hemp or other fibrous substance, is then passed through the longitudinal hole of the top and fixed to the hook, *a*, of fig. I.; the other end, after passing through the centre rings of the rests, is fixed to the swivel attached to the cord, passing through the centre hole in fig. II., to the other end of which a weight is attached, but it is not to be wedged into the hole; or the end of this seventh wire or cord which is to form the heart or core of the strand, may be attached to a swivel held by a workman. The weighted sledge is now loosened, and the hook, *a*, fig. I., turned by means of the handle; the top, held by one or more men, or if preferred fixed in a frame on wheels, is then moved regularly forward up to the swivels in fig. II., the workman holding the top, paying attention that the wires are evenly laid round the core. The rests are successively removed and replaced when the top has passed, and the finished portion of the strand is supported by being laid

on one of the cross-bars of the rest. Six strands having been completed in this manner, fig. II., is replaced by fig. V., to each of the six hooks, of which one end of each strand is attached, and after passing through the six rings of the rests the other ends of all six strands are attached to the hook, *a*, of fig. I., and the strands brought to an even tension. A larger top is then introduced between the strands, as described above, and a core of hemp or other fibrous substance, after passing through the longitudinal hole in the top, is fastened to the hook, *a*, of fig. I., the other end being held out by a workman. The six hooks of fig. V., are then turned in the same direction as the hook, *a*, of fig. I., was, in forming the strands; the hook, *a*, fig. I., is now turned in the contrary direction, and the strands laid into a rope. In laying the rope the apparatus shewn in fig. VI., may be used in place of fig. V. By the above described simple process an experienced workman can make excellent ropes, but in case he cannot "lay" the same lengths of wire so evenly as to obtain the six strands, when formed singly of the same length, by which means alone the greatest possible strength of rope can be obtained; all six strands may be formed at one and the same time, by employing fig. VI., in place of fig. I., fig. VII., in place of fig. II., and the whole combination of rests, as shewn at fig. III.,¹²³ which must be fixed to correspond one with the other, as described in making a single strand. Thirty-six wires for the six strands are then drawn out, and being passed through the rings of the rests fixed to the corresponding hooks and swivels, and weighted and fastened as previously described. Between each set of six wires to form each strand, a top (fig. IV.) is placed, as described, and the six tops are combined so as to form fig. VIII., by means of the cross-bars and wedges, the hearts or cores being added, as described. The weighted sledge having been loosened, the hooks in the jack, fig. VI., are put in motion, and the six strands are laid with fig. VIII., as before. The wires are then detached from the swivels of fig. VII. and the ends of all

six strands are fixed to the hook in the centre of this apparatus and the rope laid, as before described. The size and strength of the ropes are regulated by the size of the wires employed, but the strength of all wire-ropes depends materially on the preventing the individual wires from being twisted in themselves, which object is completely attained by the application of the swivels, *e, e, e*, which act immediately at one extremity, on the wire being twisted at the other. But as wire drawn out beyond a certain length in proportion to its size and strength, will twist in itself, before a turn given to it at one extremity can be communicated to the other; and such twisting in itself tends to materially weaken and even break the wire, the length of a perfectly sound rope that can be manufactured by the method described, must be regulated by the size and strength of the wire employed, but as ropes of great length are often required, and it is advisable to make ropes and cables with as few joints as possible, ropes of greater lengths can be made in the following manner:—Six strands are made as before described, care being taken to leave the wires of unequal lengths, by altering the lengths of the cords to which the swivels are attached. The tops having been moved forward nearly up to the first swivel, are fastened firmly to the strands, so as not to move from their proper positions, and the connecting-bars are removed from the tops. Fig. VI., is then removed and the strands which have been thus far produced are wound upon the six drums of fig. X., which stands behind fig. VI., and the ends of the strands are fastened into the hollow portions of the shafts, in such manner, that, by replacing the connecting bars, the six tops form fig. VIII. Other wires are then drawn out and joined to the ends of the first, the other ends being fastened to the swivels of fig. VII., and drawn to an equal tension by weights attached to the other ends of the cords, and the same process is repeated until the strands are formed of the required length, care

being taken always to draw the wires of different lengths, that the joints may not meet together in the strands, except when laying the last portion of the strands, when the wires are to be drawn out to an equal length. Six strands of the required length being formed and wound upon the six drums of fig. X., they are all fastened at one end to the hook of fig. VII., and the rope laid, as previously described, nearly up to the drums of fig. X., when the top is firmly attached to the rope, which is then loosened from fig. VII., and this apparatus removed. The finished portion of the rope is wound upon the drum of fig. IX., the strands having been previously loosened from the shafts, and wound for a sufficient length from the drums of fig. X. The end of the rope near the "top," is then fastened into the hollow portion of the shaft of fig. IX., and the strands, after being drawn to an even tension, into the shafts of fig. X., and this portion of the rope is again laid by turning the shafts and drums of fig. IX. and X., and the same process is repeated until the rope is completed. By the insertion of a core of hemp into the strands, as mentioned in the preceding description, much greater flexibility is attained than when a core of wire is used, and a still greater degree of flexibility can be obtained by laying six ropes, as described, made of smaller wires into a cable, round a core of hemp, or other fibrous substance. To prevent oxydation of the wire ropes, the cores of hemp, or other fibrous substance, are saturated with tar or other similar material, which by the process of laying the strands and ropes is expressed into every crevice, and covers every wire, by which means the internal parts of the rope are effectually preserved against oxydation, whilst the exterior may be coated with a similar substance; and it will be found that by saturating the cores with tar or other suitable material, before laying them into the strands and ropes, the desired object will be accomplished in a better manner than when the tar or other preservative matter is applied after making the rope.

I would here remark that although I have only described machinery for the manufacture of wire-ropes, of six wires laid round a core to form a strand, and of six such strands laid round a core to form a rope, I do not confine myself thereto, as the cores may be omitted, and by varying the parts of the machinery, the number of wires in a strand, and of strands in a rope whether with or without cores, may be increased or diminished in proportion to the strength of rope required; nor do I confine myself to the employment of the exact details of the above described machinery, in the manner and proportions described, provided the general nature of my improvements be retained. And I would remark, that I do not claim as new and as my invention such parts of the machinery described above, as have been already known and employed in the manufacture of wire-ropes; nor do I claim the manufacture of ropes of wire as a new invention, wire-ropes having been before made with and without cores, and various patents have been taken for inventions relating to the manufacture of wire-ropes; but what I claim, is first, the application of swivels, *e, e, e*, as herein described, to prevent the individual wires from being twisted in themselves whilst being laid into a strand.

Second, I claim the improvement in the form of the rests or supports, by which the separate wires and the strands of wires are retained in a circular form and at equal distances from each other, whilst the strands and ropes are being laid.

Third, I claim the application of preservative matters by saturating the cores of hemp or other fibrous material before the wires are wound thereon in forming strands, and before the wire-strands are wound thereon in forming ropes and cables; and,

Fourth, I claim the mode of combining machinery, as described, for the manufacture of wire-ropes of any required length.—In witness whereof, &c.

JOHN BAPTIST FRIED WILHELM HEIMANN.

Enrolled September 8, 1841.

Specification of the Patent granted to WILLIAM McMURRAY, of Kinleith Mill, near Edinburgh, in the County of Edinburgh, in that part of Great Britain called Scotland, Paper Maker, for certain Improvements in the Manufacture of Paper.—Scaled July 1, 1840.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My invention relates to a mode of removing water from a suitably constructed rotatory-strainer, during the process of reducing rags when making pulp for the manufacture of paper. And in order to give the best information in my power, I will proceed to describe the drawing hereunto annexed, in the different figures of which the same letters are used to indicate similar parts.

Description of the Drawing.

Fig. 1, represents a plan of the engine.

Fig. 2, is a longitudinal section thereof.

Fig. 3, is a transverse section taken through the strainer; and,

Fig. 4, shews part of a longitudinal section of the engine, in order to shew a transverse sectional view of the strainer and apparatus applied thereto, in order to remove the water therefrom. The construction of the paper-engine being well understood by paper-makers, and by machinists engaged in the construction of such descriptions of machinery; and as the construction thereof is clearly shewn in the drawing, it will not be necessary to enter into any description thereof, but confine my explanation to the mode of applying apparatus to a rotatory-strainer, used for separating water from the rags or materials as they are reduced to pulp. *a, a*, represents the rotatory-strainer: it consists of the two close ends, *a'*, which I construct of wood, and apply brass-brushes, *b*,

thereto, as is shewn in the drawing. The two ends, a^1 of the strainer are connected together by bars, a^2 ; and, a^3 , represents a strong wire, which is wound spirally around the open cylinder, formed by the bars, a^2 , and the ends, a^1 , there being grooves formed in the bars, a^2 , in which the wire lies, and by which it is retained in its place. Over the cylinder thus formed, a covering of fine wire-cloth, such as is used by paper-makers as strainers, is applied. I would, however, here remark, that although I believe that the above arrangement is best for constructing rotatory-strainers for such purposes, others of a different construction and mode of action having been before used, I do not confine myself thereto. And I am aware that it is not new to use rotatory-strainers for such purposes; I do not, therefore, make any claim thereto, my invention relating to a mode of removing the water therefrom, and such apparatus acts on the principle of the syphon, as I will now proceed to explain. c , is a tube which is fixed in bearings, d , one on the midfeather and the other on the side of the engine, as is shewn in the drawing; and in this tube the rotatory-strainer, a , moves freely; and the flow of the pulp in the engine is sufficient for giving the requisite rotatory motion to the strainer, owing to the slight friction there is in the brushes which move on the tube, c , the end, a^1 , of the strainer, a , being perfectly free to move, thus rendering any driving-apparatus to the strainer unnecessary. c^1 , is a continuation of the tube, c , and may be said to be the longer leg of the syphon. I generally make this tube, c^1 , about six feet long, but this may be varied; and at the lower end I apply a stop-cock, e , and at the upper end I apply an air escape-cock, f . And in order to fill the tube, c^1 , with water at starting, I have, at tube g , with a funnel-top, and a stop-cock at h , the use of which will be hereafter explained. c^2 , c^3 ; are two short tubes descending from the tube, c , and they may be called the shorter legs of

the syphon; they descend to as low a position as possible in the strainer, yet allowing the strainer to revolve freely.

Having thus explained the nature of the apparatus employed, I will shortly describe the mode of action; and in doing so, I will suppose the engine to be stopped, and that the tube, c^1 , is empty. In setting the apparatus for withdrawing the water from the strainer to work, the cock, e , is closed, and the air-cock, f , is to be opened, and water is poured into the tube, c^1 , through the tube, g , till the water flows into the tubes, c^2 ; the cocks, h , are then to be closed, and the cock, e , opened, when the water will continue to flow down the tube, c^1 , and thus, by a tail column in the way of a syphon, be the means, together with the pressure of the atmosphere on the water in the strainer, a , of causing a constant withdrawal of water from the interior of the rotatory-strainer, a , all which will readily be understood on a careful examination of the drawing.

I would, in conclusion, remark, that although I believe the apparatus above explained to be the best arrangement for carrying out my improvements, yet I do not confine myself thereto, so long as the character of my invention be retained, that of withdrawing the water from a rotatory-strainer in a paper-engine, by means of a syphon. And I would have it understood, that what I claim as my invention is the mode of withdrawing water from suitably constructed rotatory-strainers of paper-engines, by means of syphons, as above described.—In witness whereof, &c.

WILLIAM McMURRAY.

Enrolled January 1, 1841.

Specification of the Patent granted to WILLIAM MILLER, of Clithero, in the County of Lancaster, Engineer, for Improvements in Grates used in Steam-Engines or other Furnaces or Fire-Places.—Sealed August 1, 1839.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My improvements in grates used in steam-engine and other furnaces or fire-places consist in the peculiar manner of constructing such grates, and in the method of mounting or supporting the fire-bars composing the same, in order that the fire-bars may be simultaneously slidden in parallel horizontal directions without disturbing the vertical position, the principle feature of novelty and improvement being the movement of each alternate fire-bar in one direction, whilst the intermediate bars are moved in the opposite direction, which sliding motion being assisted by the indented or uneven surface of the fire-bars, will either entirely prevent the formation of clinkers in the furnace, or instantly break them up, thus preserving the perfect freedom of the air passage between the fire-bars, and considerably increasing the combustion and heating power of the fuel. But in order that these improvements may be perfectly understood, I have attached to these presents a sheet of drawings containing such figures as are necessary for the illustration of my invention, and have marked the respective figures with letters of reference, similar letters being placed upon corresponding parts of the apparatus.

● *Description of the Drawing.*

Fig. 1, represents a plan or horizontal view of a fire-grate for a steam-engine furnace, the top, as well as other necessary adjacent parts being removed.

Fig. 2, is a transverse section taken vertically at the line, *A, B*, in fig. 1 ; and,

Fig. 3, is a longitudinal section taken vertically at the line, *c d*., in fig. 1. The front or firing end of this grate is at *a*, and the back at *b* ; *c, c*, being two side plates, upon which are cast the angular upright supports, *d, d, d, d*, upon which the intermediate oscillating bars, *e, e, e, e*, are mounted. These bars (one of which is seen in side elevation at fig. 4) are furnished with v edged uprights, *f, f*, for the purpose of carrying the fire-bars, *g, g, g, g*, which have also corresponding recesses or notches formed upon the underside of each extremity : and it will be perceived, that each support, *f*, in one bar, *e*, is placed opposite the space between such supports in the adjacent bar, *e*, and so on at the opposite end of the grate, in order that the oscillating bars, *e¹, e¹*, may support each alternate fire-bar, and that the oscillating bars, *l², l²*, may carry the intermediate fire-bars. The horizontal sliding motion of the fire-bars is effected by the reciprocating action of the working-bar, *h, h*, moving to and fro upon its central bearings, *i, i*. It will be seen in fig. 2, that the working-bar, *h*, is provided with upright arms, *k, k, k, k*, for the purpose of taking into corresponding notches, *l*, formed on the underside of every alternate fire-bar, and that each intermediate fire-bar is also provided with an extension or leg, *m*, upon its underside, for the purpose of taking hold of the working-bar at the spaces, *n*, between the uprights, *k* ; thus it will be readily perceived, that if any adequate power were communicated to the working-bar, *h, h*, by means of the lever, *o*, connected with any first mover, the fire-bars would be simultaneously caused to slide longitudinally side by side, and in parallel planes, but in reverse directions alternately.

Fig. 5, represents a side view of one of the fire-bars detached, the indented surface being for the purpose of assisting the bars in preventing the formation of clinker, and the openings or mortices, *p, p*, being cast in them as

extra air passages. It will, of course, be very evident, that the horizontal sliding motion may be given to the fire-bars by various other contrivances, and by other arrangements of well-known mechanical agents, or that one, two, or any number of fire-bars, may be caused to move together or alternately, or even certain numbers or divisions of the fire-bars, may be stationary, whilst the others slide to and fro, all of which modifications I do not consider it necessary to describe.

Having now particularly described my improvements, and the manner of carrying the same into practical effect, I desire it to be distinctly understood, that I claim as my invention the moving or sliding fire-bars or grates or furnaces in parallel horizontal directions without disturbing their vertical positions, each alternate bar or bars moving in one direction, whilst the intermediate bar or bars move in the opposite direction, and used in combination with the uneven surface of the fire-bars for the purposes and in the manner herein set forth.—In witness whereof, &c.

WILLIAM MILLER.

Enrolled February 1, 1840.

Specification of the Patent granted to EZEKIEL JONES, of Stockport, in the County of Chester, Mechanic, for certain Improvements in Machinery for Preparing, Slubbing, Roving, Spinning, and Doubling Cotton, Silk, Wool, Worsted, Flax, and other Fibrous Substances.—Sealed June 12, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My invention of certain improvements in machinery for preparing, slubbing, roving, spinning, and doubling cotton,

silk, wool, worsted, flax, and other fibrous substances, consists in the construction and mechanical arrangement of two distinct and separate movements, applicable to machinery used for preparing, slubbing, roving, spinning, and doubling cotton, silk, wool, worsted, flax, and other fibrous substances. One of these movements is designed to regulate the varying or different speeds between the bobbin and the flyer of such machinery, so that each succeeding layer of slubbing, roving, spinning, or doubling yarn, may be placed at an equal tension, and in uniform succession, during the whole period of placing the roving or yarn on the bobbin, from the commencement on the bare spool to its largest diameter; and the other movement is designed to regulate the distribution of layers, and shape of the slubbing, roving, spun-thread, or doubled yarn on the surface of the spool or bobbin. And the manner in which the same are to be performed or carried into effect, will be seen by reference to the annexed drawings, and the following description thereof. The scale to which the annexed drawings are made, is marked thereon, and the same letters or figures of reference are used to indicate the same part of the machinery throughout. I shall now proceed to describe my improvements, as applied to the roving machine, commonly known as the bobbin and fly-frame, which is generally used for producing the finer qualities of roving; and from this application the mode of applying my improvements to other slubbing, spinning, and doubling machinery, will be readily understood; the machinery to which these improvements are applicable being always of that description in which a revolving flyer is used for distributing the roving, slubbing, or yarn.

Description of the Drawings.

Fig. 1, in the annexed drawings represents an end view.

Fig. 2, a side view, with the framing broken to reduce its size; and,

Fig. 3, a transverse section of a bobbin and fly-frame. The remaining figures represent detached parts which will be referred to hereafter. In these figures many of the ordinary parts of the machine are omitted, for the purpose of better shewing the position and construction of my improvement, and over which a light tint of colour is placed to render them better understood. In figs. 1 and 2, A, represents the fast and loose pulleys for driving the machine, the latter being keyed fast on to the shaft, great B. At the opposite extremity of this shaft is placed the differential movement, C, for governing the varying speed of the bobbin, as explained in the specification of a patent granted to Henry Houldsworth, and bearing date January, 16, 1826. This differential movement, now commonly called the "jack in box," is governed by the varying rotation of the pinion, D, as is well known to spinners and persons conversant with machinery of this description, and heretofore a cone movement has generally effected this object. My first improvement is designed to obviate the uncertainty of this rotation, when conveyed through a cone and strap. I shall now proceed to describe this improvement commencing at the pinion, great E, which partakes of the uniform rotation of the shaft, B. From the pinion, E, motion is conveyed by the spur-wheels, *e*, and *e'*, to the shaft, F, which is provided with a rib or midfeather, on which the sliding bevel pinion, *f*, supported in the carriage, F', is placed, as seen in dotted lines at fig. 4, and endwise at fig. 5; this bevel, *f*, geers into a similar one, *f'*, fixed on the small stud, G, and conveys to it a uniform and regular rotation.

Referring to fig. 4, and 5, which represent a back and end view of this part, the lower extremity of which is the stud, C, and will be seen formed into two cranks or ex-centric bearings placed at right angles to each other.

These eccentric bearings or cranks fit respectively into the lateral slots or openings in the vibrating arms or horizontal levers, *h, h*, as seen, fig. 2, and better seen at fig. 6; so that the rotation of the stud, *g*, necessarily causes the arms, *h, h*, to perform an equal vibration, and intersect each other, as indicated by dotted lines at fig. 6. This alternating motion of the arms, *h, h*, is conveyed to the bevel segments, *i* and *k*, through the hollow shaft, *i'*, and the shaft, *k'*, on which the levers, *h, h*, are respectively supported.

The form of the bevel segments, *i* and *k*, are shewn in plan, at figs. 7 and 8, and in fig. 2, they will be seen to gear respectively into the bevel-pinions, *l, l*, and *m, m*, which move free on the shaft, *n*, but are connected with the spring clicks and ratchet-wheels, *o, o*, the interior construction of which is seen at figs. 9, and 10. These spring-clicks or catches are each provided with a ratchet-wheel, as seen at *p*, fig. 9, which is keyed to the shaft, *n*, and driven by the spring-clicks, *p*, which are placed on the interior surface of the bosses, *o, o, o, o*, so that the shaft, *n*, is revolved in the same direction of rotation, at each vibration of the vibrating-arms or levers, *h, h*. This rotation of the shaft, *n*, is conveyed to the shaft, *q*, through the spur-wheels, *u, u'*, and thence to the pinion, *d*. From this arrangement it will be obvious that the speed of rotation of the pinion, *d*, must depend on the amount of vibration of the vibrating-arms or levers, *h, h*, which depends on the distance of the crank-shaft, *g*, from the centre of the shafts, *i'* and *k'*, on which the levers, *h, h*, are supported. Thus supposing the spool or bobbin, on which the roving is to be placed, to be empty, or at its least diameter; the crank-stud, *g*, would commence in the position, shewn at fig. 2, where it would impart the greatest amount of vibration to the levers, *h, h*, and consequently the greatest amount of rotation to the pinion, *d*. But as the process of filling the bobbin proceeds, the bevels, *f* and *f'*, figs. 4 and 5, are traversed along the

shaft, *r*, in the direction of the arrow at fig. 2, and the crank-shaft, *g*, is caused to act at a greater distance from the fulcrum of the levers, *h*, *h*, thereby causing a less amount of vibration, and consequently a decreased speed of rotation in the pinion, *d*. The means by which the traverse of the part, *r*¹, along with the bevels, *f* and *f*¹, is effected, will be hereafter explained; but the above constitutes one of my improvements for governing with greater certainty the varying rotation of the pinion, *d*, by which the winding on or uniform tension of the roving or yarn placed on the bobbin or spool is governed.

I shall now proceed to describe the movement by which the alternating traverse of the coping-rail is regulated, and the form of the roving is built or constructed on the spool or bobbin. On the shaft, *q*, is placed a small bevel-pinion, *g*, which geers into the bevel-wheel, *n*, placed on the shaft, *r*¹, the opposite end of which carries the bevel-pinion, *r*, geering alternately into the opposite bevel-wheels, *r*, *r*. These wheels, *r*, *r*, are keyed to the shaft, *r*¹, which is arranged to slide endwise, so that one or the other of the bevels, *r*, *r*, being in gear, necessarily produce a reverse rotation of the shaft, *r*¹. From the shaft, *r*, the rotation is conveyed to the shaft, *s*, through the pinions, *s*, *s*, and this shaft, *s*, elevates or depresses the coping-rail by rack and pinion, in the usual manner. *t*, represents a vibrating-lever moving on its fulcrum at *t*, and receiving an alternating movement from the transverse of the coping-rail, with which it is connected by the stud, *t*¹, taking into the horizontal slot, *t*². The opposite extremity of this lever, *t*, is provided with a segmental-wheel, which geers into a pinion at the back of the grooved plate, *u*, so that the alternative vibration of the lever, *t*, imparts an alternating rotation to the grooved plate, *u*. On the face of the plate, *u*, are cut two concentric grooves, in which a small stud connected with the part, *v*, is inserted: the spring-guide, *v*¹, forces this stud into the exterior groove, when revolving in the

direction of the arrow, and arrived at the point seen at fig. 2, and into the interior groove, when revolved in the opposite direction and arrived at the opposite extremity of the exterior groove. The distance between the interior and the exterior grooves on the face of the plate, u , is the exact amount of traverse required for alternately connecting and disconnecting the bevels, r , r , to which the traverse is conveyed by the part, v , and the arm, v^2 , the latter of which clasps the shaft, r^1 , and thus effects the alternating traverse of the coping-rail. The perpendicular lever, w , moves freely on its fulcrum at w , the lower end being connected with the shifting part, v , and the upper extremity provided with a projection, which rests against a stud on the revolving toothed-wheel or plate, x . By referring to fig. 2, it will be seen that this toothed plate is provided with two concentric circles of studs, pins, or teeth, the distance of which correspond with the amount of the vibration of the lever, w , so that at each vibration the lever, w , arrests or holds on a pin, stud, or tooth, in one of the circles alternately; the toothed-plate, x , having a constant tendency to revolve from the weight, x^1 , which acting through a band or chain on the rack, x^2 , revolves the spur-wheel, and pinion, x^3 and x^4 , with which the toothed-plate, x , is connected. And here I would remark, that the gradual traverse of the part, r^1 , for decreasing the vibration of the levers, h , h , is effected by this movement through the rod, x^5 , which connects the part, r^1 , with the rack, x^2 .

Having thus far explained the means by which the coping movement is effected when the spool is bare, and the winding on of the roving or yarn is commenced at the greatest traverse of the coping-rail; I shall proceed to shew how that traverse is decreased, so as to form the conical ends to the roving, as represented on the spindles at fig. 3. On the wheel, x , is attached a pinion, x^4 , which geers into the wheel, x^1 , upon which is a pinion geering into the segmental or quadrantal-wheel, y , moving on its

centre at y^1 . At every traverse of the coping-rail, which relieves a pin, stud, or tooth, on the face of the plate, x , this segmental-wheel, y , is revolved a small distance in the direction of the bent arrow. The lower segment or quadrant, y , geers into a pinion, loose on the fulcrum of the segmental or quadrant-lever, r ; this loose double pinion also geers into a straight rack, y^2 , which is connected with and governs the position of the stud, t^1 , so that every traverse of the coping-rail brings the stud, t^1 , nearer to the stationary fulcrum, t , of the segmental lever, r , and consequently a less amount of traverse of the coping-rail, produces the same rotation in the grooved plate, u , and thus the alternating movement is progressively accelerated, and the conical form of the roving thereby produced. At fig. 2, the slot or opening, t^2 , which is attached to the coping-rail to allow of the traverse of the stud, t^1 , is represented as horizontal and straight; and this arrangement I find suitable for building the conical roving, represented at fig. 3, but it is obvious that the build of the roving may be varied by varying the inclination and form of this slot; one modification of which may be understood by forming the slot into a curve instead of a straight line, which would necessarily form a barrel shaped or bobbin roving; and the same arrangement may be variously modified in spinning and doubling machinery; but such modifications are too obvious to need any elaborate description. In applying these improvements to preparation, spinning, or doubling machinery, it will be remarked that the differential movement for the winding on, as well as the varying motion of the coping-rail, on which the build or formation of the roving or yarn depends, both arise from the same source, and are dependant on the speed with which the moveable stud, t^1 , is traversed towards the fixed fulcrum, t , and that the speed of this movement may be varied by the change-pinion, x^4 , the stud of which is arranged with a slot for that purpose, thus by changing this pinion and varying

the form of the slot or guide, t^2 , any differential motion may be effected, and any build of roving or yarn may be produced on the same machine.

Having now described the nature of my various improvements in machinery for preparing, slubbing, roving, spinning, and doubling cotton, silk, wool, worsted, flax, and other fibrous substances, and the manner in which the same are to be performed and carried into effect; I do not claim as my invention any separate or well known part, of which my improvements are composed; and I am well aware that the same results may be obtained by various other combinations of parts, without varying from the essential characteristics of my invention, which consist, as regards the winding-on motion, the varying distance between the fulcrums of the vibrating levers, H , H , and the cranked stud, G ; and, as regards the coping motion, in the varying distance between the stud, t^1 , and the fixed fulcrum, t . I therefore claim as my invention, not only the combination of parts represented and described for effecting these two movements, but all such modifications of the same as are effected by the means which govern the action of these movements; all which being to the best of my knowledge and belief new, and never before used in this kingdom; I deliver this as a true and faithful specification of the same.—In witness whereof, &c.

EZEKIEL JONES.

Enrolled December 10, 1841.

Specification of the Patent granted to JOSEPH NEEDHAM TAYLER, of Red Lion Square, Bloomsbury, in the County of Middlesex, a Captain in the Royal Navy, for a certain method, or certain methods, of Abating or Lessening the Shock or Force of the Waves of the Ocean, Lakes, or Rivers, and of Reducing them to the comparatively harmless state, known by the term, "Broken Water," and thereby Preventing the injury done to, and Increasing the durability of Break Waters, Mole Heads, Piers, Fortifications, Light Houses, Docks, Wharfs, Landing Places, Embankments, Bridges, or Pontoon Bridges, and also of adding to the Security and Defence of Harbours, Roadsteads, Anchorages, and other Places exposed to the violent action of the Waves.—Sealed July 2, 1838.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—
In abating or lessening the mischiefs arising from the shock or force of the waves of the ocean, lakes, or rivers, and reducing them to the comparatively harmless state of "broken water," instead of opposing to them, as usual, a solid fixed resistance, I employ "yielding bodies," partly floating in the water, and partly resting and vibrating upon their keels, lying on the shores or bottom of the ocean, lakes, or rivers; or, in deep waters, entirely floating; the said "yielding bodies," being likewise linked or connected together by any of the usual and well-known methods; and the consequence is, that the waves, after flowing over or under the said "yielding bodies," according to the circumstances, become divided or broken, and are thus deprived of any further mischievous action. These said "yielding bodies" constitute what I term my "floating breakwaters," and may be formed in various ways, and built or constructed in many different forms, of any fit and proper material or materials, still, however, re-

taining the essential principle of "yielding" to the shock of the waves, instead of opposing them.

Description of the Drawings.

In order, however, to afford some examples of methods of carrying my said invention into effect, I shall proceed to describe the drawings which, as aforesaid, are annexed to this specification, and in which, fig. 1, is a floating cassoon or breakwater to be used for deep water, and where great buoyancy will be requisite for carrying the weight of the necessary moorings. A, the keel. B, the dead-wood or keelson. C, C, an eight inch bottom, bolted together, and the streaks next the keel are dove-tailed thereto. D, is an iron-strap (or staple-knee) outside, and E, a similar iron-knee inside, by which the heels of the timbers, S, S, are bolted and secured through the keel and keelson. F, F, are strong fore and aft binders bolted to the timbers, S, S, in a dove-tailed or diagonal direction, and in the strongest manner. G, G, are athwart-ship beams connecting the timbers, S, S. H, is a small pillar under the beam. I, is the keel of this floating cassoon, which rests on the athwart-ship beams, G. K, is the keelson. L, L, L, L, are the timbers of the cassoon. M, M, M, M, is a four inch red pine plank, rabbitted and bolted edgeways. N, N, N, N, is a two inch sheathing put on so as to break the joints of the four inch rabbitted-plank. O, is a knee worked inside, and bolted to the heels of the cassoon-timbers and an iron knee, and that to the athwart-ship beams, and fastened, as shewn in the drawing, which secures the keel of the cassoon in a proper and scientific manner together. P, P, are fore and aft binders fastened in the same manner as F, F, F, F. R, R, is a like keelson fastened to Q, Q, which represents a keel, but lying horizontally, and is fastened together, as is shewn in the drawings, through the iron breast-hook and the knee inside, and through the chocks marked T, T, T, T, between the timbers, S, S, S, S, and the five inch rabbitted-plank, as shewn in the draw-

ings, and thus connects and secures the middle together. v, the upper part, represents the knee of a ship laid the reverse way, and secured, as shewn in the drawing. w, is a pillar upon the beam, g.

Description of the Inner Bulkhead at each end of the Cassoon, as shewn in blue ink in the Section of the Cassoon when completed.

The diagonal pieces, marked 1, 2, are twelve inches square, and chased in the cassoon timbers at their ends, but let in half and half in the middle. The main or upright timber, marked 3, is tenanted like a pillar, but in the middle there is an iron-plate worked in the inside to connect the diagonal trusses or timbers, 1, 2, together. Out of the cassoon timbers, L, L, L, L, a rabbit is to be taken each way to secure the ends of the bulk-head planks, and the athwart-ship planks, and when caulked and secured, as shewn in the drawing, will, in every respect, be water-proof. This floating cassoon-breakwater is eighteen feet beam, and thirty-one feet deep, of which one-third floats above the surface of the water.

Fig. 2, is an end view of another floating breakwater, which is composed entirely of red pine timber, so arranged that three-fourths of the quantity of the timber will be immersed in the water, and will thereby give a buoyancy (after carrying the top weight) of ten tons to each length of ninety-three feet six inches. Its total altitude will be eighteen feet, it floating twelve feet below, and six feet above, the surface of the water, and ten feet beam. A, A, are the main upright timbers, eighteen feet high, twelve inches by ten inches. B, B, B, B, the main athwart-ship beams, ten feet long, twelve inches by six inches, one on each side of the uprights, A, A, and halved into the same one inch way. The ends of all these timbers, A, A, and B, B, are dove-tailed, as shewn in the drawing, and the ends of the main beams, B, B, are filled solid by six inch dove-tailed chocks. c, c, are double keels, each twelve

inches by eight inches, bolted in a dove-tailed or diagonal direction to the upright timbers, A, A, which are four feet apart. These keels are ninety-three feet six inches long, and when they are scarfed or joined, there is a solid dove-tailed chock let in between them, so as to give additional strength. D, D, is the dead-wood or keelsons running parallel with the keels, twelve inches deep, and eight inches broad at top by four inches at bottom. E, E, E, E, are the timbers, nine inches by six inches, stepped on the keels and keelsons, as shewn in the drawing. There are forty of these on each side which will leave them twenty-one inches apart. F, F, F, F, are fore and aft binders eight inches by four inches, let in one inch into the heels of the timbers, E, E, are bolted through the keelsons, D, D, and the main upright timbers, A, A. G, G, G, G, are strong fore and aft binders, eight inches square, and let into the timbers, H, E, E, E, one inch ; but it will be more secure if the binders be placed inside and outside the timbers, E, E, E, E, each to be four inches by eight inches, and bolted together through the timbers, E, E, E, E. H, H, H, H, are athwart-ship beams or braces, ten inches by five inches, one on each side of the upright timbers, A, A, being halved therein one inch each way ; these support the fore and aft binders, G, G, G, G, G, G, and also the timbers, E, E, E, E. I, I, I, I, are the fore and aft shear planks, each fifteen inches by six inches, which are bolted in a dove-tailed or diagonal direction to the main athwart-ship beams, B, B. K, K, act as knees, or braces, for connecting the upper and lower timbers, E, E, E, E, together, into which they are tenanted. They are ten inches by six inches, and are secured between the main braces, B, B, taking a bearing on the fore and aft shear planks, E, E, E, E, as shewn in the drawing. L, L, is the line of immersion. The spaces, M, M, between the timbers, E, E, and the braces, K, K, are to be filled up with chocks, running fore and aft the whole length through which the timbers, E, E, and the braces, K, K, are to be bolted for greater security, as shewn in the

drawing. All the bolts and fastenings are shewn by dotted lines. The floating part above the surface of the water is similar to the lower part, and will not require further description. The whole will be secured from working by diagonal braces from shear to shear under the floating or water-line, with the exception of light fore and aft diagonal braces above that line. Should it be found necessary to increase the buoyancy of this breakwater, it will only require hollow wooden trunks, made in any convenient lengths, say from twenty to thirty feet fore and aft, as shewn by the dotted lines at N, N. A square trunk of one foot in the clear on each side running the entire length, will give an extra buoyancy of five tons, and if two feet square inside, be equal to twenty tons. For attaching the floating breakwater to its moorings, there are two strong iron braces, seven inches wide and one and a half inches thick, made in the form of a T, as shewn by the dotted lines. o, o, are on each side of the upright timber, A, A. These cross the tops of the dead-wood or keelsons, D, D, and rest thereon, and are bolted through the timbers, E, E. A double set of these are placed on the second or third main timbers, A, A, from each end of the breakwater, and the mooring-chains are attached thereto by a four inch bolt passing through a shackle of sufficient strength.

I shall now describe my improved method of mooring my floating breakwaters or buoys. The present iron mooring-chains, if of requisite strength, would be so ponderous, that very great buoyancy would be necessary in the breakwaters, &c., to float or carry them, thereby greatly increasing their expense without adding to their efficacy. It being admitted that straight grained timber will bear a much greater strain or tension than an equal weight of iron, I propose, chiefly, to form my moorings of the former material: for this purpose I select clean straight grained red fir, larch, or American ash, in twelve feet lengths. The centre piece, as shewn in fig. 3, and marked

A, A, is nine inches deep and four and a half inches thick, on each side of which are the pieces, B, B, each nine inches deep, and two and a quarter inches thick, making the whole nine inches square ; between these pieces I insert two lengths of vat hoop iron, six inches wide and one-eighth of an inch thick ; these are secured at each end of the timbers, to prevent them from drawing or working ; and these two strips of iron will alone bear a strain of twenty-four tons. These three pieces of plank or timber are united together by square flat iron hoops, E, E, E, E, E, E, which should be driven on red hot, in order that they may become perfectly tight by their contraction when cold. At each end of the centre, A, A, are three saw-cuts about two feet long ; into the centre cuts an oak wedge, D, D, is to be driven, so as to spread all the timbers about four inches, and thus forming a dove-tail, as shewn in the drawing. Before driving these wedges, the strong flat iron hoops, E, E, and the staples, F, F, are to be placed in their respective positions, and brought tight by the wedges. The staples, F, F, are made of $\frac{1}{2}$ -inch square bar-iron, two feet long, the holes or eyes two inches in diameter ; to receive a bolt of that size, they should be flush, or be let in the timbers ; they are turned up, or welded double at the ends, so that they cannot be drawn from the hoops, E, E, without compressing the timbers. These moorings are shackled together by a link of common mooring-chain of the requisite strength between each. I estimate the specific gravity of these moorings (exclusive of the connecting-links) not to exceed twenty hundred weight above that of the water in which they are immersed. These moorings may also be made with solid pieces or lengths of square or round timber, shackled or joined together, as before described, but I prefer making them in separate thicknesses, hoop-iron being inserted therein for greater strength. When the rise or fall of the tide is considerable, it will be necessary to have a certain length of common chain to connect these moorings to the anchors

or mooring-blocks, as they are never intended to strike the ground, but merely to act as an intermediate connection between the breakwater and its fastenings or anchorages. For in-shore protection, or where the ebb tide leaves the beach dry for a considerable distance, I employ a similar breakwater, as that described in drawing No. 3, but of less beam or breadth, and its altitude will depend on the depth of water, as it proceeds from the shore, or the rise of the tide. To secure it in its position, I drive a double row of strong piles in a diagonal direction, they being four feet apart at top, and eight feet apart at their lower ends. The heads of these piles are connected by two pieces of strong timber, halved in each way, and securely bolted together through the pile-heads. These I run out beyond low water; they stand about two feet above the surface of the beach, and each set are placed about twelve feet apart. In these the breakwater rides, and it is secured thereon by strong iron straps and bolts, which hold it firmly down, but which do not prevent it from rocking or vibrating sideways. From the top of each length of this breakwater are two lengths of chain or mooring, carried out on each side to any convenient distance; and they are left slack to allow the breakwater to rock on its keel or base, and thus yield to a force of the heavy sea. A, A, A, A, fig. 4, is the chime-piece of another floating-buoy or breakwater, fifteen inches by eighteen inches, with a rabbit taken out of it, as shewn in the drawings. B, B, B, B, are two pieces bolted on each side of the main piece marked C, C, for the better security of the ends of the plank. D, is a fore and aft piece that crosses every floor, and is let in half and half, and then a keelson is let down upon it, which connects the whole together in a fore and aft direction. E, E, E, E, E, E, is the frame work of the bottom of the buoy as well as of the top. F, F, are the timbers that are dove-tailed into the chime-piece marked A, but are let in from the inside, and the dove-tail is not allowed any further than is shewn in the drawing, though

they themselves go to the plank, as shewn in the drawing. The four inch plank for the top and bottom is rabbitted, and lies fore and aft, but the sheathing lies the reverse way; and where the chain is proposed to be, there must be a staple standard; that is, where c, c, and F, F, are marked in the drawing. From the centre of this buoy there is a mast about twenty feet high, stepped on the deck, which is secured by shrouds, and fore and aft stays, made of round bolt-iron; and rattlings, may be added thereto, to enable men to ascend for protection, in case of need. For ballast, I prefer covering the floor timbers with gravel or shingle, and grouting it in with asphalte, or any other cement, to prevent it from shifting, and at the same time it will prevent leakage. These buoys are to be moored by a bridle-chain, extending from each side of the bottom of the chime-piece amid-ships, for which purpose strong iron-straps descend from an athwart-ship beam on the surface of the deck into which the mast is stepped, so that no leakage can take place in the body of the buoy from the working of the bolts or fastenings. These bridle-chains descend about twenty feet, where they are connected to the main mooring by a swivel-joint; they will thus prevent the buoy from rolling in a heavy sea.

Although I have given the sizes of the various parts, in order to assist in describing them, yet I do not mean or intend to limit or confine myself to employ those sizes only, neither do I mean or intend to limit myself to the employment of floating breakwaters of the form here given, but to vary them as circumstances may require, still, however, retaining the essential property of "yielding" to the shocks of the waves, instead of resisting them as usual.—In witness whereof, &c.

JOSEPH NEEDHAM TAYLER.

Enrolled January 2, 1839.

Specification of the Patent granted to GEORGE CLAUDIUS ASH, of Broad Street, Golden Square, in the County of Middlesex, Dentist, for Improvements in Apparatus for Fastening Candles in Candlesticks.—
Sealed June 12, 1841

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—
My invention relates to the construction of metal filling-pieces to be introduced between candles and the interiors of the sockets of candlesticks; such filling-pieces being separate instruments, and capable of being used at different times with several candlesticks; and such filling-pieces being elastic are capable of accommodating themselves to various sizes of candles and candlesticks. And in order that my invention may be fully understood, and readily carried into effect, I will proceed to describe the drawings hereunto annexed.

Description of the Drawings.

Fig. 1, represents the upper part of a candlestick having a candle therein and retained securely by a metal filling-piece, or elastic wedge, according to my invention.

Fig. 2, shews a plan, an edge view, and a front view of the apparatus separately; and,

Fig. 3, shews a front view of a similar construction of apparatus, it being fluted to give it better holding. The apparatus consists of a plate of steel or other suitable metal, cut to the form shewn by the drawing, such plate being at a^2 , thus producing the two surfaces, a , a^1 , which, by the elasticity of the metal, will have a tendency to keep separate one from the other, and when in use, the two parts, a , a^1 , will come more or less close together, and, by their elastic action, they will hold the candle securely, as will readily be understood on examining the drawing. I would remark, that although I consider the apparatus,

shewn at figs. 1, 2, and 3, to be the best form of construction, yet I do not confine myself thereto, as variations may be made, so long as the peculiar character of the apparatus be retained, that of being what may be called an elastic-wedge, capable of being placed between the interior of a candlestick and a candle therein.

Fig. 4, shews another construction of apparatus, consisting of the two parts, a, a^1 , the part, a , being a concave surface suitable to come against the surface of a candle, and the part, a^1 , is a spring affixed at the back of the part, a , as is shewn; and it will be evident, that the spring, a^1 , will act in the same manner as the part, a^1 , of figs. 1, 2, and 3. It is not absolutely necessary that the surfaces, a, a^1 , should be close surfaces; on the contrary,

Fig. 5, shews an apparatus made of wire, the nature of which being clearly shewn by the drawing, will require no further description.

Fig. 6, shews arrangement of parts, a, a^1 ; the connection, a^2 , between the parts, a, a^1 , being vertical; in other respects, the instrument will act similarly to those before explained.

Having thus described the nature of my invention, and the best means I am acquainted with for performing the same, I would remark, that I am aware that it has been proposed to construct candlesticks with what may be called spring-holders or sockets for candles, in connection with and forming part of a candlestick. I do not, therefore, claim the retaining candles in candlesticks by means of spring instruments generally, but do confine my claim of invention to the mode of fastening candles in candlesticks, by applying elastic metallic wedges or filling-pieces, which, being separate from the candlestick, may be used with different candlesticks, as above described.—In witness whereof, &c.

GEORGE CLAUDIUS ASH.

Enrolled December 12, 1841.

Specification of the Patent granted to THOMAS ROBINSON, of Wilmington Square, in the County of Middlesex, Gentleman, for Improvements in Drying Wool, Cotton, and other Fibrous Materials, in the Manufactured and Unmanufactured State.—Sealed April 27, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—The invention relates to peculiar constructions of machinery, by means of which wool, cotton, and other fibrous materials, in the manufactured or unmanufactured state, may be dried with facility; and in order that the invention may be most fully understood and readily carried into effect, I will proceed to describe the drawings hereunto annexed.

Description of the Drawings.

Fig. 1, represents an external side view of a machine, constructed according to the invention.

Fig. 2, represents an external end view.

Fig. 3, shews an underside view of the machine.

Fig. 4, shews a section of the machine, taken transversely, of the main-shaft or axis.

Fig. 5, shews a section of the machine, taken in the direction of the length of the main-shaft or axis.

Fig. 6, shews an outer end view of one of the revolving compartments or chambers, which are carried by the main-shaft or axis of the machine; and,

Fig. 7, shews an inner end view of the same chamber. In each of the above-mentioned figures, the same letters indicate the same parts. *a, a, a*, shews the chamber within which the revolving machinery works; this chamber is closed at all parts except the openings for admitting air near the main-shaft or axis, and openings through which the air passes out of the chamber, and there are

other openings for the passage of the water or fluid, from the materials which are being dried. And it will be found that the air will be received near the axis or main-shaft, in a similar manner to a blowing machine, and the air so received will pass over and amongst the materials, in the revolving drying compartments of the machine, and will then be forcibly ejected from such revolving compartments, and from the chamber, *a, a*, in which they revolve. *b*, is the main-shaft or axis of the machine, which receives motion from a steam-engine or other power, by means of an endless strap working on the fixed drum or pulley, *c*, or by other means, as is well understood by engineers and other workmen; or motion may be communicated to the axis, *b*, by means of hand labour, by the crank handle, *e*, giving motion to the cog-wheel, *f*, affixed on the axis of the handle, *e*, such cog-wheel, *f*, taking into and driving the pinion, *g*, affixed on the main-shaft or axis, *b*, as is clearly shewn and will readily be understood on examining the drawings. *h, h*, are two revolving compartments, within which the cotton, wool, or other fibrous materials, whether manufactured or unmanufactured, when in a wet state are placed; these compartments, *h*, being affixed to the main-shaft or axis, *b*, as is shewn. I would remark, that although I prefer the use of two revolving compartments, other numbers may be employed, making provision for the air to enter near the axis or shaft, *b*. The compartments, *h, h*, are composed of the two side plates, *h**, *h**, by which they are affixed to the axis or shaft, *b*, and also by the other side plates, *h¹*, *h¹*, which plates do not extend from end to end of the two revolving compartments, but the side plates *h¹*, leave a space on either side of the axis, *b*, through which the air can pass, as is indicated by the arrows. *h²*, are a series of bars, which partially close the inner ends of the compartments, *h*, and prevent the articles which are to be dried falling through in that direction. *h³*, *h³*, are other bars, which close the outer ends of the chambers, *h*, and such bars

should be more or less close, according to whether the articles are in large or small pieces, and whether they are in a manufactured or unmanufactured state, to prevent the same being forced out of the chambers, *h*, when in rapid revolution. *h⁴, h⁴*, are doors hinged to the revolving compartments, *h*, by which the articles to be dried are to be introduced into the compartments, such doors being securely fastened when the machinery is in motion. *i, i*, are openings in the outer chamber, *a*, through which the air is ejected, as is indicated by the arrows; and thus it will be evident that rapid currents of air will be constantly passing through the compartments, *h*, whilst the articles therein will be constantly changing their position, and by the force with which such articles will be pressed against the outer bars, *h³*, the water or liquid will be quickly expressed and the articles dried. There are openings, *j, j*, on either side of the chamber, *a*, by which the air passes into that chamber, and thence through the compartments, *h*, as above described. *k, k*, are doors in the chamber, *a*, by which the articles to be dried are to be introduced into the compartments, *h*, and by which they are to be removed therefrom when dried. I would remark, that although I consider the above arrangement of machinery the best, for the purposes of drying wool, cotton, and other fibrous materials, whether in the manufactured or unmanufactured state, I do not confine myself thereto, as the same may be varied; and in order to shew that such may be the case, I have shewn a somewhat different arrangement, which consists of a rotatory-wheel, *h, h*, having four compartments for receiving the articles to be dried, which may be produced by dividing the wheel by means of a series of bars, *h⁴*, or they may be close partitions; *h²*, shews the bars which partially close the inner ends of the compartments, and *h³*, are the bars which partially close the outer ends of the revolving compartments. *h⁶, h⁶*, are a series of holes on each side of the machine, through which the air enters near the axis or shaft, and

thence passes through the chambers, *h*, in like manner to what has before been described. *h*⁴, are doors by which the articles to be dried are introduced into the revolving chambers, *h*. This revolving apparatus is enclosed in a similar chamber, *a*, to that above described.

Having thus described the nature of the invention, and the manner in which the same is to be performed, I would have it understood, that what I claim is the mode of constructing machines for drying cotton, wool, and other fibrous materials, in a manufactured or unmanufactured state, as herein described.—In witness whereof, &c.

THOMAS ROBINSON.

Enrolled October 27, 1841.

Specification of the Patent granted to JOHN WILKIE, of Nassau Street, Mary-le-bone, Upholsterer, and JOHN CHARLES SCHWIESO, of George Street, St. Pancras, Musical Instrument Maker, both in the County of Middlesex, for Improvements in Constructing Elastic Seats or Surfaces of Furniture.—Sealed March 2, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—Our invention relates to a mode of constructing the elastic seats or surfaces of furniture, by forming the bearing surfaces in separate parts, and combining those parts with springs, whereby the bearing surfaces will be rendered most agreeably elastic, and will be found far superior to the present modes of using laths or webbing, as the bearing surfaces of seats and other stuffed or padded surfaces of furniture. And in order that our invention may be most fully understood, and readily carried into effect, we will proceed to describe the drawing hereunto annexed.

Description of the Drawing.

Fig. 1, represents the side section of a chair, having an elastic surface constructed according to our invention.

Fig. 2, shews a section of a French bedstead.

Fig. 3, is part of a plan of fig. 2, shewing the construction of an elastic surface according to our invention; and,

Fig. 4, shews a plan and edge view of part of one of the bars or laths of which the elastic surfaces are composed, and we prefer these bars to be of hoop-iron; and although we have shewn the surfaces as being only applied to chairs and bedsteads, it will readily be understood that elastic surfaces, according to our invention, may be applied to sofas and other parts of furniture requiring similar elastic surfaces. In each of the above-mentioned figures, the same letters indicate similar parts. *a, a*, represent the parts of which the elastic surfaces are composed: these bars or laths are secured to the back and front rails, as is shewn in fig. 1, or to the two side rails, as is shewn in figs. 2 and 3; and in a similar manner may they be applied to a sofa or other similar frame. *b, b*, are rods which are affixed to the rails, *c, c*, of the frame of the piece of furniture to which an elastic surface, according to our invention, is desired to be applied; the portions of the bars or laths, *a, a*, have springs applied thereto in the following manner. *d, d*, are spindles passing through openings formed in the turned down ends of the separate parts of the bars or laths, *a, a*. On to each of these spindles is applied a coiled spring, *e*, which resting against a washer, *f*, at one end, is retained on the spindle by a screw-nut and washer at *g*, there being a pin, *h*, to retain the spindle through the turned down ends of the parts of the bars or laths, *a, a*; it will therefore be evident, that if pressure takes place on the upper surface of the bars, *a*, those bars can be deflected, as is indicated by dotted lines in fig. 2; and when the pressure is

removed or lessened, the springs will cause the parts (of which the bars, *a, a, a*, are composed) to return to or approach an even or a straight surface; and it should be remarked, that when the length of a bar or lath, *a*, is considerable, such as for a bedstead; each bar or lath, *a*, should have two, three, or more elastic spring-joints, which, allowing the bars or laths, *a*, to bend in their length at various parts, will produce an agreeable elasticity to such surfaces of furniture.

We would remark, that we have thus shewn and described the best means of carrying out our invention with which we are acquainted, but we do not confine ourselves to the precise arrangement of the details of elastic spring-joints to the bars or laths, *a, a*, so long as those bars or laths are made in part, and combined by elastic spring-joints acting in the manner above described. And we would have it understood, that we do not claim any of the separate parts herein described. The elastic surfaces so formed to chairs, sofas, bedsteads, and other parts of furniture requiring similar surfaces, are to be covered with cushions, squabs, or mattresses, or when for seats or reclining surfaces, the elastic surfaces may be stuffed as heretofore, when webbing was used. And we wish it to be understood, that what we claim as our invention is the mode herein described of making elastic surfaces of furniture by causing each bar or lath to be composed of parts connected by elastic spring joints, as herein described.—In witness whereof, &c.

JOHN WILKIE.

JOHN CHARLES SCHWIESO.

Enrolled September 2, 1841.

Specification of the Patent granted to CHARLES PAYNE, of South Lambeth, in the County of Surrey, Gentleman, for Improvements in Salting Animal Matters.
—Sealed October 13, 1840.

To all to whom these presents shall come, &c. &c.—
My invention relates to a mode of salting animal matters requiring to be cured or preserved, and consists of submitting such animal matters to the action of pressure, or pressure and a vacuum in a close vessel. It may be remarked, that animal matters are charged with a quantity of air or aeriform fluid, which is diffused through the mass. Now, it will readily be understood that if air be driven out or exhausted therefrom, the entry of a liquid will be facilitated, and this can be best accomplished by producing a vacuum in a close vessel containing the animal matter, and allowing brine to fill or nearly fill the said vessel, when, by means of pressure the brine will enter the mass and fill the cavities previously filled with air, and thus the whole mass will be impregnated with brine and be salted. The construction of the apparatus for effecting my invention is exceedingly simple, being on the principle of the ordinary air-pump used for pneumatic experiments, with the addition of a force pump for supplying the liquor. The vessel which is to contain the animal matter, being of iron or other metal strong enough to resist the pressure, and of a size depending on the quantity of meat it is to contain at one time; the pieces of meat intended to be salted, are to be placed or packed in the receiver, which, however, is not to be quite filled therewith, and the pieces are to be prevented from floating in the brine by a false cover having holes through it. The cover (which is fitted with an air-tight joint, either by packing or other well known means) is now to be put on and screwed or otherwise fastened down. The exhausting-pipe is at or near the top of the

vessel to avoid contact with the brine, which might otherwise get into the pump. As good a vacuum as practicable is to be obtained in the receiver, and which may be indicated by a mercurial vacuum-gauge communicating therewith. When the vacuum is obtained, brine is admitted through a pipe furnished with a stop-cock, from a tub or other vessel constantly filled with the same; that brine is not allowed to fill the receiver but only to about one half in the first instance, and the air-pump is again worked, and then the brine is allowed to flow into the receiver until the whole of the meat is covered. The air-pump is again worked, to remove any air that may still remain in the meat or in the vessel. The brine may now be allowed to fill the receiver, and a force-pump consisting of a plunger and valves, similar to that used in Bramah's hydraulic pump, be worked to pump in brine, until a safety-valve loaded to above one hundred to one hundred and fifty pounds per inch is lifted, indicating a pressure in the receiver to that amount; this pressure facilitates the penetration of the brine through the meat. The whole apparatus is now to remain fifteen minutes to an hour, dependent on the sizes of the pieces of meat in the receiver; the lid may then be removed, and the meat taken out, the operation being then completed. I would remark, that by using the apparatus above described, meat may be salted without the use of the vacuum; but I have found that by the aid of the vacuum, the process is rendered more certain and much quicker.

Having thus described the nature of my invention, and the best means I am acquainted with for performing the same. I would have it understood, that I do not confine myself thereto, as the apparatus may be varied, provided the general character of my invention be retained; and as the object of the process is to obtain salt in animal matters, I lay no claim to any particular means of preparing the liquor used for salting; but what I claim is the mode of salting animal matters (preserved or cured

by salt), by causing the liquors used to penetrate into such animal matters by pressure or pressure and vacuum, when such matters are contained in a suitably closed vessel.—In witness whereof, &c.

CHARLES PAYNE.

Enrolled April 12, 1841.

Specification of the Patent granted to JAMES SHANKS, of Saint Helen's, Lancashire, Chemist, for Improvements in the Manufacture of Carbonate of Soda.—Sealed May 27, 1841.

To all to whom these presents shall come, &c. &c.—It is well known that the carbonate of soda of commerce or white ash, as it is commonly called, as usually prepared by manufacturers, is not a pure carbonate, but contains more or less of caustic soda, and silicate of soda, in proportions liable to much variation, my object is to convert these substances into carbonate of soda and in the case of the manufacture of crystals to increase the quantity of these to be obtained from the soda liquors. This I do in either of the two following methods:—First, I take the masses of black ash or impure carbonate of soda, as prepared by manufacturers, and break them into fragments about the size of a cubic inch. I then place them into a stone or iron close vessel or chamber, in layers of three or four inches in thickness, which layers are then moistened with water. Into this chamber, which I call a carbonator, there are fitted, at opposite ends, an entrance and an exit-pipe for the gases. I introduce a stream of carbonic-acid gas, which is kept up till the whole of the soda and lime are carbonated. This point may be easily ascertained by the escape of sulphuretted hydrogen, which is well known by its peculiar smell. The black ash thus prepared is then removed to the vats

and treated in the ordinary way. I prefer to stop the carbonating process at this point, but it may be carried on till all the sulphuretted hydrogen is expelled. A pipe of one inch in diameter, with a pressure equal to one quarter of an inch of a column of water, will admit a sufficient quantity of gas to carbonate one ton of ash at a time. In my second method for obtaining similar results, which is the plan I prefer, I treat the black ash in the manner usually adopted by manufacturers; that is to say, I make a lye from the black ash, and then operate on the solution in the following manner:—I construct a vessel or chamber, which I call a carbonator, made of any suitable material, such as iron or stone; the form I prefer to be square, and not less than ten feet high, and providing sixteen cubic feet of space for every ton of soda-ash, and six cubic feet of space for every ton of crystals to be made per diem. Into this apparatus I throw an arch of open brick-work across the bottom, and fill the remaining space with pebbles about a cubic inch in size, and introduce a stream of carbonic-acid gas by a pipe under the arch, which immediately diffuses itself among the pebbles. The soda liquor from the vats is then conveyed to the top of the carbonator, either by means of a pump, or by spouts, as the relative levels of the carbonator and vats may suit, and the impure lye, falling in numberless rills through the interstices of the pebbles, meets the carbonic-acid in its ascent, and becomes perfectly carbonated. This point is ascertained by the liquor having lost its greenish yellow colour, and having assumed a transparent or whiteish appearance, which is readily seen on its leaving the bottom of the carbonator by a water-trap provided for this purpose. The quantity of carbonic-acid to be applied in this case is not material, provided it is in excess, which is indicated as already described. I vary this process by taking the last or weakest liquors from the vats, and passing them through the carbonator, thereby surcharging them with carbonic-acid gas, and then using these liquors for

lixiviating the fresh charges of black ash in the vats. The carbonic acid may be obtained by any of the known means ; but I prefer (because most suitable under the general circumstances of soda or alkali making,) to produce it by the action of muriatic-acid on lime stone. I find that a cubic generator of six feet in the side, and a cubic carbonator of ten feet in the side, are sufficient to carbonate sixty tons of soda ash per week.

Having thus described the nature of my invention, I would have it understood, that I do not confine myself to the precise details, provided the peculiar character of my invention be retained. And I claim as my invention the taking of black ash, as commonly made by manufacturers, or the solutions made therefrom, and the converting the caustic soda and silicate of soda therein contained into carbonate of soda, by the means herein described.— In witness whereof, &c.

JAMES SHANKS.

Enrolled November 27, 1841.

Specification of the Patent granted to WILLIAM HORSFALL, of Manchester, Card Maker, for an Improvement or Improvements in Cards for Carding Cotton, Wool, Silk, Flax, and other Fibrous Substances.—
Sealed October 1, 1840.

To all to whom these presents shall come, &c. &c.— Now know ye, that whereas the backs or foundations of the cards for carding cotton, wool, silk, flax, and other fibrous substances, have been heretofore, for the most part, made of leather, but are attended with this disadvantage, that from want of uniformity in the texture of leather, some cards are not so flexible as others ; and even in the same card great differences are found to exist in this respect, some parts being stiff and rigid compared

with others, which cards, or parts of cards, that are of inferior flexibility, are also less durable than the others. And whereas it has been sought to obviate these defects by substituting backs made of sheet caoutchouc, and of caoutchouc and linen or cotton cloth cemented together, and of woollen cloth saturated with a solution of caoutchouc; but such backs also are found objectionable on account of their liability to be injuriously affected by changes of temperature, and also to become damaged from drops of oil accidentally falling upon them, by which so much of the caoutchouc as the oil comes in contact with is dissolved, or nearly so.

Now I declare that the nature of my said invented improvements consists in making the backs or foundations of cards for carding cotton, wool, silk, flax, and other fibrous substances, firstly, of thick woven cloth, made of fine sheeps' wool shot upon a warp of flax, hemp, or cotton thread, coated with certain compositions, by which the flexibility of the cloth is little, if at all, impaired, while the coating itself is of a smooth, even, and pliable surface, not liable to crack or be injuriously affected by contact with oils or changes of temperature; or,

Secondly, of a thick woollen cloth, with a web of thin smooth cotton, or other suitable fabric, cemented thereto on one or both sides; and I declare that the manner of performing the said invention is as follows:—To make the first of the before mentioned descriptions of backs or foundations, I procure a thick woven cloth, made of fine sheeps' wool shot upon a warp of flax, hemp, or cotton thread, milled, and fulled up to the thickness hereinafter mentioned, and well shorn on both sides. For the medium sort of cotton cards this cloth should weigh from twenty-six to twenty-eight ounces per square yard, and for the medium sort of flax cards, it should weigh about thirty-six ounces per square yard. For the finer sorts of each of these descriptions of cards, the cloth should weigh a few ounces less than the quantities just specified, and for

the coarser a few ounces more. Various substances may be made use of and applied in various ways to give this cloth the requisite coating ; but the substances and the method which I prefer are the following :—I first give the cloth a priming composed of water, good whiting, and well boiled linseed oil, using as much whiting as the water will hold in solution, and adding no more oil than is necessary to make the mixture spread easily without running ; or, instead thereof, I use for priming a composition, such as painters call distemper, made of a weak size mixed with ochre. When the priming is dry, I brush it over with a weak size, in order to dampen it slightly, and then rub the cloth down with pumice-stone, to remove any roughness which may remain on the surface ; should the cloth appear not to be then sufficiently primed, I give it a second coat of priming, leaving it to dry, and afterwards rubbing down the cloth with pumice-stone, as before ; I then give the cloth a coating of linseed oil, boiled to the consistency of a thick cream, and laid on evenly ; the cloth is then set to dry, and if saving of time is an object, the process of drying may be accelerated by subjecting the cloth to a temperature of about 180 degrees of Fahrenheit. A good coating, especially for the coarser sorts of cards, may also be compounded of any oil-paint mixed with a solution of soap in the proportion of 1 lb. of soap dissolved in 6 pints of water to about 1 cwt. of the paint ; or, of glue and treacle or molasses, mixed in the proportion of about one part of glue to about two parts of treacle, with the addition of a small portion of boiled linseed oil. And in employing either of the two last mentioned compositions, one coating only for one side will be necessary. But whatever may be the material or materials employed, this general rule must be observed, that where oils or substances, of an oily nature are used, they must either be mixed up with other substances to prevent their running and penetrating into the cloth, or have a layer or layers of prim-

ing interposed between them and the cloth before their application thereto. I have spoken of the coating as applied to one side only of the cloth, but it may be applied to one or both sides according as the card-maker may judge expedient. And now, to describe the manner of making the second of the before mentioned improved sorts of backs or foundations for cards, I declare, that I take a cloth of weight and thickness similar to that before described, which may be made wholly of sheeps' wool, both in the warp and weft, and cement thereto on one or both sides a web of thin smooth cloth of cotton, or any other suitable material, or mixture of materials, using for the purpose a cement of glue and treacle, or any other, which is of sufficient adhesiveness and not injuriously acted upon by oils. In all cases the wires are inserted into and secured in the backs of foundations by the usual card making machinery, and in the usual manner.

And having now fully specified the nature of my said invented improvements, and the manner in which the same are to be performed, I declare, that though I have hereinbefore described, what I consider to be the best means of giving a suitable coating to my improved backs or foundation for cards, and also described certain other means which I do not consider so good; I do not confine myself to the use of these means, or any of them exclusively, but claim a right to the use of all similar means by which the like useful effects may be produced; that is to say, by which such cloth backs may have a coating given them, by which the flexibility of the cloth is little, if at all, impaired, while the coating itself is of a smooth, even, and pliable surface, and not liable to crack or to be injuriously affected by oils or changes of temperature; and I declare, that what I claim generally as my improvements in cards, consist in making the backs or foundations thereof, firstly, of thick woven cloth, made of fine sheeps' wool, shot upon a warp of flax, hemp, or cotton-thread, and coated as hereinbefore described; or,

Secondly, of a thick cloth, composed altogether of wool, and covered with a web of thin smooth cotton, or other suitable fabric cemented thereto; and whether such backs or foundations are so coated or covered on one or both sides thereof. And such my said invention being, to the best of my knowledge and belief, entirely new, and never before used within that part of Her Majesty's United Kingdom of Great Britain and Ireland, called England, her Dominion of Wales, or the town of Berwick-upon-Tweed, I do hereby declare this to be my specification of the same, and that I do verily believe this my said specification doth comply fully, and in all respects without reserve or disguise, with the proviso in the said hereinbefore in part recited letters patent contained, wherefore I hereby claim to maintain exclusive right and privilege to my said invention.—In witness whereof, &c.

WILLIAM HORSFALL.

Enrolled April 1, 1841.

Specification of the Patent granted to WILLIAM THOMPSON CLOUGH, of Saint Helen's, in the County of Lancaster, Alkali Manufacturer, for Improvements in the Manufacture of Carbonates of Soda and Potash. —Sealed March 17, 1841.

To all to whom these presents shall come, &c. &c.—My invention relates to a mode of obtaining soda chry-stals more advantageously, and the invention also relates to the preparing what are called dry carbonates of soda and potash of commerce, in order to render such carbonates more useful when applied to bleaching purposes, and such improvements consist of means of employing silica, as hereafter explained. And in order that my invention may be most fully understood and readily carried into effect, I will proceed to describe the means pursued

by me, first remarking that I prefer to employ similar sand to that used by flint-glass manufacturers, though I do not confine myself thereto, as other silica may be used. In carrying out my invention, I throw into the furnace, a quantity of silica with the alkali (soda or potash) in the process of manufacture, in such proportion as to be sufficient to saturate the caustic alkali which they may contain, thus converting it into silicate of potassa, or soda, as the case may be. And I apply silica either to the alkaline liquor in the boiling-down furnace where it is reduced to a salt, previous to drying and finishing, or by preference when for soda, ash; or potash of commerce I mix, with a shovel or other instrument, the silica with the salts from the boiling-down furnace, and throw the combined materials into the finishing or carbonating-furnace. I mix from ten to fifteen per cent. of silica to the salts drawn out of the boiling-down furnaces, and then finish the salts in the ordinary manner; in fact the whole process of making salts is pursued as heretofore, excepting the using of silica, by which the results obtained will be materially benefitted. In the process of crystallization of carbonate of soda, the resulting "mother salts" from the residual liquor retain the whole of the silicate of soda, whilst the larger part of the carbonate has separated in crystals nearly pure and colourless, and I find that a larger product or "crop," of crystals is obtained, and the value of the mother salt improved.

I would remark, that although I have been particular in thus describing the means pursued by me in combining silica, in the manufacture and preparation of the crystals of soda and dry carbonate of potash and soda of commerce, I do not confine myself thereto, as other means may be resorted to for applying silica, in the manufacture of the carbonate of soda and potash, the object being to neutralize the causticity of those alkalies in the progress of manufacture, and thus to obtain more useful products by compounding silica therewith. I, however, believe that the above

described means are the best for carrying out my invention, particularly when crystals are required, and the dry ash or carbonate of soda of commerce are both to be made ; but when only the dry ash or carbonate of soda of commerce be required for the purposes of the bleacher, a very similar product to that obtained by me from the mother waters, as above described, may be produced by simply combining a quantity of silicate of soda or potash with the carbonate of soda or of potash of commerce, in such proportion that the mixture shall contain twenty per cent. of silicate of soda or potash ; and such mixing may be performed in any convenient manner, either in the state of powder, and mix them mechanically, or when the alkali is in a state of solution in water ; I do not, however, confine myself to the above per centage, though I believe twenty per cent. will be the most beneficial. I would remark, that for salts of potash I proceed after the same methods, as are above described, but I reduce the per centage from ten to seven. I would state that a larger quantity of silica, than what has been above mentioned, will not materially prejudice the working, and the use of less silica than is required to neutralize the causticity will produce only proportionable benefit in the process of manufacture. And I wish it to be understood, that I am aware that it is not new to produce silicate of soda or potash, by combining silica with carbonate or caustic soda or potash, and I make no claim thereto ; my invention having for its object, first, the use of silica to neutralize the causticity of the salts of soda and potash, and thus to facilitate the obtaining crystals of carbonate of soda ; and, secondly, to obtain carbonate of soda or potash in combination with silicate of soda or potash, by which means the properties of the carbonate of soda or of potash, will be found to be materially enhanced.—In witness whereof, &c.

WILLIAM THOMPSON CLOUGH.

Enrolled September 17, 1841.

Specification of the Patent granted to HENRY BROWNE, of Codnor Park Iron Works, in the County of Derby, Iron Manufacturer, for Improvements in the Manufacture of Steel.—Sealed April 22, 1841.

To all to whom these presents shall come, &c. &c.—My invention relates to a mode of manufacturing steel from iron, by obtaining the iron in a fine granulated state, and then treating it with cementation with carbon, as hereafter described; and in order that my invention may be fully understood, and readily carried into effect, I will proceed to describe the means pursued by me. In working according to my invention, the crude, or pig, or refined metal is to be treated as if about to be made into bar or malleable-iron, by the purifying and decarbonizing process of puddling; that is, by stirring the melted mass in the furnace with iron tools, and exposing it to the action of the heated air, as usually practised, until the metal becomes in a dry granulated state, all which is well understood by puddlers; and in place of carrying on the process further in the puddling furnace, the iron, in the granulated state, is to be removed from the furnace, and when cold, a large proportion may be passed through sieves, the meshes of which are about twenty in an inch, and the remainder may be crushed or ground, until the grains will pass through the same sieve, or the various sized grains may be separated by various sieves, differing in the size of the mesh according to the will of the operator; but I consider that the smaller the grains the more advantageously will the process of manufacturing steel therefrom, be carried on; and it is the converting of granulated iron, such as above described, into steel, by cementation with carbon, that constitutes my invention.

The granulated iron is next submitted to cementation, which I perform in the following manner:—I use an ordi-

nary cementing or converting-furnace, the nature of which is well known, and the cementing-chests, or what are usually called pots, are about ten feet long, three feet wide, and three feet deep, but the dimensions may be varied. I prepare a number of frames of iron or wood—I prefer wood, and that which is called pine, an inch or two less in length and breadth, so that they will pass easily into the pots; the frame, made of wood, about a quarter of an inch thick, and one inch deep, and divided by wood partitions at distances of about every ten or twelve inches. The carbon I prefer to use is wood-charcoal crushed and passed through a sieve, the meshes of which may be about one quarter of an inch square, though other carbon may be used. I place a quantity of the charcoal to the extent of about half an inch in thickness over the bottom of the pot; and this I cover with paper or other suitable substance, on which I place one of the wood-frames, and fill the compartments thereof with granulated-iron, before described. On the surface of the granulated-iron I place another covering of paper, and apply more charcoal, and press it into all the spaces between the frames and the sides of the pot; and I cover the paper evenly to the extent of half an inch; I then apply another thickness of paper, then another frame, which I fill with granulated-iron, as before, and cover it with paper, then charcoal, then paper, and then another frame, and so on until the pot is full, having charcoal on the top to the extent of three or four inches deep; I then cover the whole close down with loam-sand or “swarf” from a cutlers’ grinding-mill, or other suitable substance, to exclude the air, tempered and spread over the top of the pot to the thickness of five or six inches. I now heat the furnace to a high heat, as is well understood by steel manufacturers, and let the pot and its contents remain at that heat for a sufficient time, which I find to be from thirty to sixty hours; the time and heat may be varied according to the

state of carbonization required. The pot and its contents are to remain until cool, and, when opened, the steel will be formed into cakes of the size of the compartments in the frames, and may be removed, the charcoal and paper may be brushed off. The steel thus produced is then broken into pieces and melted in the usual manner in crucibles. The high or low state of carbonization may be judged of by the colour, which will vary from blue to purple, straw colour, and grey; that which is blue having less carbon, and is less firmly united together; and that which is grey, and more united, is charged in a higher degree with carbon. The quality and hardness of the steel may be varied by a judicious selection of the cemented steel, so as to adopt it to the purposes to which it has to be applied.

Having thus described the means I consider best calculated for carrying into effect my invention, I wish it to be understood that I do not confine myself thereto, provided the peculiar character of my invention be retained; but what I claim is the mode of manufacturing steel by obtaining iron in a granulated state by the means above described, and submitting the same to cementation with carbon.—In witness whereof, &c.

HENRY BROWNE.

Enrolled October 22, 1841.

Specification of the Patent granted to JOHN BETHELL, of Saint John's Hill, Wandsworth, in the County of Surrey, Gentleman, for Improvements in Treating and Preparing certain Oils and Fatty Matters.—
Sealed March 28, 1840.

To all to whom these presents shall come, &c. &c.—
The object of my invention, as far as relates to improve-

ments in treating and preparing of oils, is to render certain oils, viz., whale, elephant whale, Newfoundland whale, seel, rapeseed, teel, olive, palm, cocoa-nut, or any of the other common oils, more useful either for lubricating machinery, or for the purposes of illumination, and which object I effect, in the first instance, by separating, clarifying, or precipitating a portion of the gelatinous albusinous, or other matters contained therein; and, secondly, (when such are required for burning in lamps or for illumination) by adding thereto a portion of hydrocarbass, or essential oils, hereinafter named; and as regards the treating and preparing of certain fatty matters, the object of my invention is the manner in which I have hereinafter described, from butter of palm, cocoa-nut oil, or any other vegetable concrete oil, an oil which is more useful for mixing my purified oils, and which process also improves the fatty matter or concrete oil so operated upon, and which improvements I propose to carry into effect, in manner hereinafter described (that is to say):—As to that part of the invention which relates to oils:—

First Process.

I take any or either of the common oils above named, and I purify them from the gelatinous albusinous and other matters contained therein, by first thoroughly well mixing the oil with a solution of tamrin, which may be obtained from any of the vegetable matters yielding it; but I prefer using a strong infusion of gall-nuts in hot water, of which I take ten gallons, and thoroughly mix it 100 gallons of oil in any convenient manner. This mixture must afterwards be allowed to rest for three or four days, until all the tamrin infusion and precipitate matter has settled down to the bottom. The clear superabundant oil is then drawn off and again agitated and mixed with a solution of either acetate of lead, acetate of alumine, or

sulphate of zinc, which I prefer using in the following proportions; viz., 1 lb. of acetate of lead dissolved in 6 gallons of water, or 1 lb. of acetate of alumine dissolved in 4 gallons of water, or 1 lb. of sulphate of zinc dissolved in 6 gallons of water; and I mix 10 gallons of either of such solutions with 100 gallons of oil; but I do not confine myself to these proportions as solutions of different strengths can be advantageously used for different oils. The oil, after three or four days' rest, is drawn off from the top, and, if not sufficiently clear, must be filtered through oil-bags in the usual manner. During the period that the oil is undergoing the above operations, I prefer that it be kept at a temperature as near 17° Fahrenheit as possible. Should the oil be afterwards found to contain too much water, I cause it to be agitated with about 10 per cent. of fresh calcined sulphate of lime in fine powder, or well dried carbonate of soda to abstract the greater part of the water from it. The sulphate of lime or soda must be allowed to precipitate by rest, or the oil must be filtered through bags.

Second Process.

I take the oil as purified by my first process, or I take the more fluid parts of cocoa-nut or palm-oil; and for the purpose of making a good burning lamp-oil, I add thereto from 5 to 10 per cent. of either of the following essential oils or hydrocarbons; viz., petroleum or rock-oil, Persian naphtha, fine oil of turpentine, or the best essential-oil, obtained from the distillation of coal-tar on the oil, obtained, as hereinafter described, by distilling any of the above essential oils with palm or cocoa-nut oil, the quantity to be added depends on the kind of oil operated upon, and upon its strength, and will vary between 5 and 10 per cent., but will be easily ascertained by trying a small sample of the oil first. The essential-oil, or hydrocarbon, must be intimately combined with

the oil, either by thorough agitation together, or by passing the vapour of the essential-oil, or hydrocarbon, into the oil in an apparatus similar to a Wolfe's apparatus, but the former method I prefer for general use. In some cases, either from the oils operated upon being of a superior quality, or from so fine an article not being required, it is not necessary to use both the above processes, as either of them will be found sufficient for the purpose required. If a superior burning lamp-oil is required, I prefer using both of the above processes; but for a common lamp-oil the oil may be prepared by either one of the above processes, without being submitted to the other, particularly when it is prepared by the second process only, and for a lubricating oil the first process only is used. As to the treating and preparing fatty matters, I take the "butter of palm," or "rough palm-oil," or rough "cocoa-nut oil," or any other concrete vegetable oil, and add to either of these 20 per cent. of either of the essential oils above named; put it into a common still and distill off the essential-oil, and the volatile matter which rises from the palm or cocoa-nut oil, but I prefer distilling with steam, and for that purpose I put the mixture into a close wood-vat, furnished with a steam pipe, leading from a steam-boiler, and branching out into several other pipes placed in the bottom of the vat, and pierced with small holes, the charging-hole of the vat being shut, steam is driven through the mass, and the volatile products are conducted through a pipe fixed in the top of the vat to a common distilling-worm, placed in cold water. The volatile oil so condensed I mix with the oils for burning in lamps, as above mentioned, and the concrete fatty matter remaining in the vat is run out into casks, and will be found much improved, and more useful for many purposes.

In describing my improvements, I have stated the proportions of the different materials to be used, which I

prefer, but I do not confine myself to such proportions, as they may be advantageously varied for different oils.—
In witness whereof, &c.

JOHN BETHELL.

Enrolled September 28, 1840.

Specification of the Patent granted to WILLIAM NEWTON, of Chancery Lane, in the County of Middlesex, Civil Engineer, for an Improved Medicinal Compound or Ferruginous Preparation to give Tone and Vigour to the Human System, particularly applicable in Cases of Weak Digestion, and in the Diseases culled Chlorosis.—Sealed June 12, 1839.

To all to whom these presents shall come, &c. &c.—
This improved medicinal compound is a mixture or combination of ferruginous preparations with farinaceous matters, intended to be taken into the stomach by way of food, in the form of bread, biscuits, or cakes. The invention is communicated to me by M. De Herrypon, of Paris, and is to be carried into effect by the following means:—A given quantity of ferruginous preparation, (say of the soluble salts of iron,) is to be dissolved in a suitable quantity of water, and this water so impregnated with the iron is to be employed as the menstruum or liquid, for mixing up a given quantity of flour into dough. The proportions of the iron to the flour must be according to the complaint, disease, or physical state of the patient, and may be regulated by the advice of the physician or other medical attendant. The dough so prepared, having been properly kneaded, is to be baked into bread, biscuits, cakes, or other suitable forms, and is then fit to be eaten by the patient as an article of food, as part of his or her daily aliment. By such administration of the iron in small quantities, the constitution of the patient will be gradually

restored to its natural tone of health and vigour, and in a much more effective and agreeable manner than if taken in doses by the ordinary means of solution, or by other modes.

This medicinal compound, when made up in the form of biscuits, may be readily carried at sea, or upon a journey, as an article of food, and may be continually taken by persons suffering under the complaints above alluded to. In hospitals and in the Army and Navy, under circumstances of extensively prevailing disorders among the men, such as scurvy, this mode of introducing iron and other suitable medicines into bread or biscuit, subject to the direction of the medical adviser, will be found to be extremely convenient and efficacious, and the materials may be so mixed, that the patients shall not be aware of the bread which they are eating being medicated.

I have said above, that the proportionate quantities of the preparations to be mixed with the flour, employed for making the bread, should be regulated by the advice of a medical man, as it is impossible to give any definite directions, for in all cases the quantities must depend upon the state or character of the disease to be combatted, and of the particular preparations of iron and other matters employed to arrest the disease, or to restore the constitution to health and vigour.—In witness whereof, &c.

WILLIAM NEWTON.

Enrolled December 12, 1839.

NOTICE OF EXPIRED PATENTS.

(Continued from page 120.)

JOHN LEVERS, of Nottingham, Machine Maker, for certain improvements in machinery for the manufacture of bobbin net lace.—Sealed March 3, 1828.

WILLIAM POWNALL, of Manchester, Weaver, for improvements in making healds for weaving purposes.—Sealed March 6, 1828.—(*For copy of specification, see Repertory, Vol. 8, third series, p. 7.*)

BARNARD HENRY BROOK, of Huddersfield, Civil Engineer, for improvements in the construction and setting of ovens or retorts for carbonizing coal for the use of gas-works.—Sealed March 6, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 358.*)

WILLIAM RODGER, of Norfolk Street, Strand, London, Lieutenant in the Navy, for certain improvements on anchors.—Sealed March 13, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 279.*)

ROBERT GRIFFITH JONES, of Brewer Street, Golden Square, London, Gentleman, for a method of ornamenting china, and certain other compositions, which he denominates lethophanic, translucent or opaque china. Communicated by a foreigner residing abroad.—Sealed March 13, 1828.

GEORGE SCHOLEFIELD, of Leeds, Mechanic, for certain improvements in, or additions to, looms, for the purpose of weaving woollen, linen, cotton, silks, and other cloths.—Sealed March 13, 1828.

NATHAN GOUGH, of Salford, Lancashire, Civil Engineer, for an improved method of propelling carriages or vessels by steam or other power.—Sealed March 20, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 162.*)

SAMUEL CLEGG, of Liverpool, Civil Engineer, for improvements in the construction of steam-engines, and steam-boilers, and generators.—Sealed March 20, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 283.*)

JANE BENTLEY LOWRY, Wife of Thomas Sampson Lowry, of Exeter, Straw Hat Manufacturer, for improvements in the manufacture of hats and bonnets.—Sealed March 25, 1828.—(*For copy of specification, see Repertory, Vol. 8, third series, p. 327.*)

EDWARD COWPER, of Clapham Road Place, in the parish of St. Mary, Lambeth, in the county of Surrey, Gentleman, for improvements in cutting paper.—Sealed March 26, 1828.

FERDINAND DE TONVILLE, of Piccadilly, in the county of Middlesex, Merchant, for improvements on filtering apparatus.—March 26, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 290.*)

THOMAS LAWES, of the Strand, in the county of Middlesex, Lace Manufacturer, for an improved thread, to be used in the manufacture of the article commonly called bobbin-net lace.—Sealed March 29, 1828.

HENRY MARRIOTT, of Fleet Street, in the city of London, Ironmonger, and AUGUSTUS SIEBE, of Princes Street, Leicester Square, in the county of Middlesex, Machinist, for improvements in hydraulic machines.—Sealed March 29, 1828.

PETER TAYLOR, of Hollinwood, in the county of Lancaster, Flax Dresser, for improvements in machinery for hackling, dressing, or combing flax, hemp, tow, and other fibrous materials.—Sealed March 29, 1828.—(*For copy of specification, see Repertory, Vol. 8, third series, p. 267.*)

JOHN DAVIS, of Leman Street, Goodman's Fields, in the county of Middlesex, Sugar Refiner, for an improvement in boiling or evaporating solution of sugar, and other liquids. Communicated by a foreigner residing abroad.—Sealed March 29, 1828.

PATENTS GRANTED FOR SCOTLAND,

From January 19, to February 16, 1842.

JOHN LEE, of Newcastle-upon-Tyne, Manufacturing Chemist, for improvements in the manufacture of chlorine.—Sealed January 19, 1842.

JOHN THOMAS CARR, of the town and county of Newcastle-upon-Tyne, for improvements in steam-engines. Communicated by a foreigner residing abroad.—Sealed January 19, 1842.

ROBERT STIRLING NEWALL, of Gateshead, in the county of Durham, Wire Rope Manufacturer, for improvements in the manufacture of flat bands, and in machinery for the manufacture of wire-ropes.—Sealed January 20, 1842.

CHRISTOPHER NICKELS, of York Road, Lambeth, in the county of Surrey, Gentleman, for improvements in the manufacture of napped fabrics.—Sealed January 27, 1842.

JOHN JONES, of the Smethwick Iron Works, near Birmingham, in the county of Stafford, Engineer, for certain improvements in steam-engines, and in the mode or methods of obtaining power from the use of steam, part of which improvements are applicable to the raising or forcing water, and for other purposes.—Sealed February 4, 1842.

JAMES THORBURN, of Manchester, in the county of Lancaster, Machinest, for certain improvements in machinery for producing knitted fabrics.—Sealed February 4, 1842.

NATHANIEL BENJAMIN, of Camberwell, in the county of Surrey, Gentleman, for improvements in the manufacture of type. Communicated by a foreigner residing abroad.—Sealed February 11, 1842.

LOUIS LACHENAB, of Tichfield Street, Soho, Mechanic, and **ANTOINE VIEYRES**, of Pall Mall, Watchmaker, both in the county of Middlesex, for improvements in machinery for cutting cork.—Sealed February 11, 1841.

JOHN GEORGE BODMER, of Manchester, in the county of Lancaster, Engineer, for certain improvements in propelling vessels on water, part of which improvements apply also to steam-engines to be employed on land.—Sealed February 14, 1842.

GEORGE MANNERING, of Dover, in the county of Kent, Plumber, and **HENRY HARRISON**, of Ashford, in the same county, Plumber, for certain improvements in the means of raising of water and other fluids.—Sealed February 16, 1842.

LIST OF NEW PATENTS.

JOHN JAMES BAGGALY, of Sheffield, Seal Engraver, for certain improvements in combs for the hair, and which are also applicable to combing other fibrous substances.—Sealed January 29, 1842.—(*Six months.*)

JOSEPH HUGHES, of Whitehall Mills, Chapel-le-firth, Derby, Paper Maker, for certain improvements in the method or process of manufacturing paper.—Sealed January 29, 1842.—(*Six months.*)

JAMES HUNT, of Whitehall, Gentleman, for improvements in the manufacture of bricks.—Sealed January 31, 1842.—(*Six months.*)

CHARLES WYE WILLIAMS, of Liverpool, Gentleman, for certain improvements in the making and moulding of bricks, artificial fuel, and other substances.—Sealed January 31, 1842.—(*Six months.*)

HENRY FOWLER BROADWOOD, of Great Pultney Street, Golden Square, Esquire, for an improvement in that part of a piano-forte, harpsichord, or other the like instrument, commonly called the name-board.—Sealed February 2, 1842.—(*Six months.*)

WILLIAM NEWTON, of Chancery Lane, Civil Engineer, for certain improved apparatus to be adapted to lace-making machinery, for the production of a novel description of elastic fabric from silk, cotton, woollen, linen, and other fibrous materials. Communicated by a foreigner residing abroad. — Sealed February, 8, 1842. — (*Six months.*)

ADDERLEY WILCOCKS SLEIGH, K. T. S., of Manchester, Captain in Her Majesty's Service, for a certain method, or certain methods, of effecting and forming sheltered floating-harbours of safety, by the employment of certain buoyant sea-barriers applicable thereto, and which said improvements are also applicable to and useful for the formation of breakwaters, floating-bridges, light-houses,

and beacons, the protection of pier-heads, embankments, and for other similar purposes.—Sealed February 8, 1842.—(*Six months.*)

CHARLES HANCOCK, of Grosvenor Place, in the county of Middlesex, Artist, for certain improvements in printing cotton, silk, woollen, and other stuffs.—Sealed February 8, 1842.—(*Six months.*)

BENJAMIN BIRAM, of Wantworth, Yorkshire, Colliery Viewer, for certain improvements in the construction and application of rotary engines.—Sealed February 8, 1842.—(*Six months.*)

FREDERICK HARLOW, of Rotherhithe, Carpenter, for improvements in paving or covering roads and other surfaces, and in the machinery for cutting the material to be used for those purposes.—Sealed February 9, 1842.—(*Six months.*)

ISHAM BAGGS, of King's Square, Middlesex, Chemist, for improvements in obtaining motive power by means of carbonic-acid, and also by a peculiar application of heated air.—Sealed February 9, 1842.—(*Six months.*)

CHRISTOPHER NICKELS, of York Road, Lambeth, Gentleman, for improvements in the manufacture of plaited fabricks.—Sealed January 10, 1842.—(*Six months.*)

WILLIAM BROOK ADDISON, of Bradford, Manufacturer, for certain improvements in machinery for spinning worsted and woollen yarn.—Sealed February 10, 1842.—(*Six months.*)

GEORGE JARMAN, of Leeds, Cotton Spinner, ROBERT COOK, of Hathersage, Derby, Heckle and Needle Manufacturer, and JOSHUA WORDSWORTH, of Leeds, aforesaid, Machine Maker, for certain improvements in machinery for spinning flax, hemp, and tow.—Sealed February 14, 1842.—(*Six months.*)

JAMES ANDREW, of Manchester, Manufacturer, for certain improvements in the method or process of preparing or dressing yarns or warps for weaving.—Sealed February 15, 1842.—(*Six months.*)

CHARLES THOMAS HOLCOMBE, of Bankside, Southwark, Iron Merchant, for certain improvements in the manufacture of fuel, and in obtaining products in such manufacture.—Sealed February 15, 1842.—(*Six months.*)

JOHN OSBALDISTON, of Blackburn, Metal Heald Maker, for improvements in looms for weaving.—Sealed February 15, 1842.—(*Six months.*)

ALEXANDER ROUSSEAU, of the Strand, Manufacturer for improvements in fire-arms. Communicated by a foreigner residing abroad.—Sealed February 15, 1842.—(*Six months.*)

GEORGE HADEN, of Trowbridge, Engineer, for certain improvements in apparatus for warming and ventilating buildings.—Sealed February 15, 1842.—(*Six months.*)

JOHN LEWTHWAITE, of East Street, Manchester Square, Engineer, for improvements in steam-engines and boilers.—Sealed February 15, 1842.—(*Six months.*)

THOMAS RUSSELL CRAMPTON, of Lisson Grove, Engineer, and **JOHN COOPE HADDAN**, of Moorgate Street, Civil Engineer, for improvements in steam-engines and railway-carriages.—Sealed February 15, 1842.—(*Six months.*)

ROBERT WORNUM, of Store Street, Bedford Square, Piano-Forte Maker, for improvements in the actions of piano-fortes.—Sealed February 15, 1842.—(*Six months.*)

DANIEL GREENFIELD, the Elder, of Birmingham, Brass Founder, for an improvement in the manufacture of hollow metal knobs for the handles of door and other locks.—Sealed February 21, 1842.—(*Six months.*)

MOSES POOLE, of Lincoln's Inn, Gentleman, for improvements in treating, refining, and purifying oils, and other similar substances. Communicated by a foreigner residing abroad.—Sealed February 21, 1842.—(*Six months.*)

THE
REPERTORY
OF
PATENT INVENTIONS.

No. C. NEW SERIES.—APRIL, 1842.

Specification of the Patent granted to MOSES POOLE, of the Patent Office, Lincoln's Inn, in the County of Middlesex; Gentleman, for Improvements in Stretching Cloths.—Scaled March 22, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.---
The invention relates to the employment of a peculiarly constructed machine, by which cloths may be stretched with considerable advantage and with greater facility than when using the tenter-frames now in use; and in order that the invention may be readily understood and carried into effect, I will proceed to describe the drawings hereunto annexed, and the figures and letters marked thereon.

Description of the Drawing.

Fig. 1, represents a side elevation of a machine constructed according to the invention.

Fig. 2, is a plan.

Figs. 3 and 4, are end views thereof; and the other figures shew some of the details on a larger scale; and it will be found that the same letters are used to denote

the same parts wherever they are employed. The machine consists of a revolving-frame in which the cloth is received and held and stretched. *a, a*, are the side framings of the frame which receive the cloth. *b, b*, are plates or projecting-surfaces on which the cloth is received and securely held by bent spikes or points, as hereafter described. There is one of the projecting-plates or surfaces applied to each of the framings, *a, a*, and the plates or surfaces, *b*, are affixed spirally on the two side framings, *a, a*. The two side framings, *a, a*, are placed on an axis, *c*, one of them being fixed to that axis, and the other capable of sliding thereon, in order to receive the cloth when in its narrowest condition, and afterwards to stretch it in its width, by causing the moveable framing, *a*, to slide on the axis, *c*, in a direction away from the fixed framing, *a*, of the machine; and the selvages of the cloth or fabric being held on the surfaces or plates, *b*, the cloth will be stretched. On the axis, *c*, is fixed a loose pulley, *d, d*, by which motion is given to the axis, *c*, by an endless strap moved by any suitable power, as is well understood by engineers. Or motion may be given by a man working with the handle, *d*, and thus, by the pinion, *d*¹, and the wheel, *d*², gives motion to the axis, *c*, as is clearly shewn in the drawings. *e*, is a bar across from framings, *a, a*, such bar, *e*, having a number of bent points or hooks, on to which one end of the cloth is put when commencing to introduce a piece of cloth into the machine, and the bar holds the cloth as it is drawn into the machine, in order that the cloth may be got evenly into the machine. The axis, *c*, is hollow, and has a screw, *f*, capable of being revolved therein by the handle, *g*, the screw being supported within the axis, *c*, by the bearings, *h, h*. In the axis, *c*, are two slits, *i, i*, through which projections, *j*, of a screw-nut, *j*¹, pass; and it will be evident, that the screw-nut, *j*¹, will move to or from the handle, *g*, according to the direction in which that handle is turned within the boss or nave of the

moveable framing, *a*, which consists of two parts screwed together, as is shewn, there are formed recesses, *j*², into which the projections, *j*, are received; hence when the handle, *g*, is turned, the boss or nave of the moveable framing, *a*, will slide along the axis, *c*, and in a direction to or from the handle, *g*, according to the direction in which that handle, *g*, is turned; by this means, when a piece of cloth has been placed in the machine, and held therein by the bent spike or points on the surfaces, *b*, the cloth may be stretched in its width by causing the moveable framing, *a*, to move towards the handle, *g*, having previously removed the end of the cloth from the bent hooks on the bar, *e*. The cloth is fixed and retained in the machine in the following manner: *m, m*, are bent spikes or points affixed on the plates or surfaces, *b*, at intervals. On to these points, the selvages of the cloth are placed by workmen standing on each side of the machine, and the cloth being thus held, the moving on the axis of the moveable side framing, *a*, will stretch the cloth in width. The cloth to be stretched is first wound on a roller, *n*, which moves on an axis, *o*, in bearings carried by the side framings, *p*, there being a bar, *q*, with bent points or hooks fixed on such roller, *n*, in order that the end of the cloth may be kept even, both in the winding on and off of the cloth, so that the centre of the cloth may not be unequally dragged on; hence, during the winding of the cloth on to the surfaces, *b, b*, the cloth will be retained evenly at the two ends by the bars with bent points or hooks at the respective ends of the cloth. *r, r*, are rollers through which the cloth is passed from the roller, *n*, the upper roller, *r*, being pressed upon the lower one by levers and weights, as is clearly shewn in the drawing. After passing through the rollers, *r*, the cloth is carried over the circular brush or roller, *r*¹, covered with a suitable adhesive surface; by these means any desired resistance may be obtained to the unwinding of the cloth when winding it on the surfaces, *b*.

Having thus described the nature of the invention, and the manner in which the same is to be performed, I would have it understood that I make no claim to any of the parts separately; but what I claim is the mode herein described of constructing a machine for stretching cloths.—In witness whereof, &c.

MOSES POOLE.

Enrolled September 22, 1841.

Specification of the Patent granted to ELIJAH GALLOWAY, of Manchester Street, Gray's Inn Road, in the County of Middlesex, Engineer, for Improvements in Propelling Railroad-Carriages.—Sealed November 2, 1840.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention relates to a mode of propelling carriages on rail-roads by means of a moveable rail or bar, and wheels of different diameters; and in order most fully to explain the nature of the said invention, and the manner of performing the same, I will first describe the diagram.

Description of the Drawings.

Fig. 1, which is intended to illustrate the mechanical principle on which the working of my invention depends. *a, a*, represents the circumference of a wheel placed upon a rail, *b, b*; and *c, d*, is a rod, shewn as attached thereto by a pin at *c*. Now, if the rod, *c, d*, be moved, say between *d* and *k*, the wheel, *a, a*, will roll along, *b, b*, a much greater horizontal distance than the rod, *c, d*, moves. And if, instead of the joint and pin, *c*, there were another wheel represented by the circle, *f, f*, fixed to the wheel, *a, a*, or to the fixed axis thereof, and a bar or rail, *g, d*, be moved, when kept in contact with the

wheel, *f, f*, in such manner as not to slip on the surface of the wheel, the wheel, *a*, would move on the fixed rail, *b, b*, a much greater horizontal distance than the bar, *g, d*, moves; that is, the wheel, *a*, would move six feet during the movement of the bar, *g, d*, through a space of one foot. Having thus explained the diagram, fig. 1, in order that the principle of action on which my invention depends may be understood, I will now describe

Fig. 2, which represents a plan of such parts of a railway-carriage and railway as are necessary to shew the nature of my invention. *i, j, i, j*, are four wheels of a rail-road carriage, and *r, r*, the ordinary fixed rails of a railway. *k, l*, are sections of two double flanged wheels of one-sixth less diameter than the wheels *i, j*. The wheels, *j* and *k*, are both keyed on one axis, *m*, and the wheels, *j* and *l*, on the axis, *n*. There are ball and socket-joints, *s, t*, as is shewn in the drawing, to connect the axis and allow the middle wheels, *k, l*, to rise and fall to the slight undulations of the road. *g, d*, is the propelling-rail placed midway between the fixed rails, and supported on flanged-rollers, and capable of moving freely thereon. It may be of wood or iron, or both combined, and I prefer making it of wood, plated with iron, to prevent warping; but instead of extending along the whole line, it will consist of detached portions, the lengths of which will depend on local circumstances, such as the gradients and curves; but as a general rule, I should prefer to have stationary engines, which give motion to the driving-rails at about a mile or a mile and a half apart. The propelling-rail may be moved by a toothed-rack on the underside of the rail, and a toothed-wheel working therein on the engine-shaft, or by a chain attached to the end of the rail and winding round a drum, moved by the engine or by other convenient means; and if, as in the case here given, the velocity of the carriage be six times that of the propelling-rail, the rail, *g, d*, will be one-sixth less in length than the distance between the stations, to allow the rail to

propel the carriage over its whole length, before it can come in contact with the next length of rail. If a rack be used to move the rail, by reversing the engine, the rail can, after the carriage has left it, be retained to its original position ; but if chains and drums be the means employed, then there should be one at each end to wind and unwind, in the manner of the ropes on the London and Blackwall railway. The proportions of the propelling-rail in its depth and thickness, as well as the number of rollers, will depend on the weight to be supported. I should, however, observe, that where there are curves, the rail should be so proportioned as to bend round them without becoming permanently deflected. The carriage has six springs (shewn by dotted lines, *p, p, p, p, p, p*) pressing on the bearings, which are fitted into vertical mortices, as in other railway-carriages. These springs are capable of adjustment by screws, or other well-known means, so as to regulate the pressure of each wheel on the rails, and thus obtain a sufficient pressing together of the surfaces in contact of the rails and the wheels, as to prevent slipping.

Now it will be evident, upon the mode of action explained by the diagram, fig. 1, that if the propelling-rail, *g, d*, be put in motion, the carriage will move along the railway at six times the velocity of the propelling-rail. I would, however remark, that the difference of velocity between the carriage and rail may be varied by changing the relative diameters of the wheels ; the speed of the carriage, as compared to that of the propelling-rail, being, as the greater diameter is to the difference between the two diameters of the wheels. Where there are considerable activities on the line of rail-road, I propose to connect the axis at their junction by an universal joint, instead of the ball and socket-joint, shewn in the drawing, in which case the middle and side wheels will revolve together, and the surface contacts of the wheels, *k, l*, with the propelling-rail, and the contact of the wheels, *i, j*, with the

fixed rails of the railway will all combine in propelling the carriage.

Having now described the nature of my said invention, and the manner in which the same is to be performed, I would have it understood that I lay no claim to the parts of the carriage and railway which have been previously in use ; nor do I claim any of the parts separately. And I am aware that pulleys of different diameters, with endless ropes and a pulley and wheel, having a rope passing around such pulley, have before been proposed to be used, and a patent was obtained by Joseph Saxton, Mechanician, June 20, 1833, for the same ; I therefore wish it to be understood that I make no claim to any arrangement of machinery, pulleys, or wheels, for propelling carriages on railroads, when combined with an endless or other rope passing around one or more pulleys ; but what I claim as my invention is the mode of propelling carriages on rail-roads by the application of a moving-rail or bar acting against a wheel or wheels of different diameter to the other wheels of the carriage, by which means I am enabled to propel carriages, on rail-roads at much greater velocity than the speed of the moving or propelling-rail or bar, as above described.—In witness whereof, &c.

ELIJAH GALLOWAY.

Enrolled May 1, 1841.

Specification of the Patent granted to ALEXANDER PARKES, of Birmingham, in the County of Warwick. Artist, for certain Improvements in the Production of Works of Art in Metal by Electric Deposition.—Sealed March 29, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My invention relates to the manufacture of works of art,

of silver and of gold, by causing these metals to be deposited by electric agency in or on suitable moulds or models. And in order that my invention may be most fully understood and readily carried into effect, I will proceed to describe the means pursued by me, and which I have found fully to answer. But I would first remark, that in making works of art of gold or of silver, as heretofore practised, two modes have been resorted to, first, that of casting, and which is performed by casting molten gold or silver in suitable moulds of sand, and other materials, and subsequently finishing by gravers and other tools, as is well understood; and, secondly, by obtaining gold or silver in sheets, and by means of dies and pressure or by hammering or stamping the same, the desired form or pattern of the sheet metal is produced, and the surfaces of which in some cases are afterwards ornamented by hand by the graver and other tools, as is also well understood. And I would further remark, that I am aware that silver and gold have been deposited from a state of solution on to copper and other metal surfaces by means of electric currents, for the purposes of permanently gilding and silvering such metal surfaces, and a patent was obtained by George Richard Elkington and Henry Elkington, of Birmingham, on the 25th of March, 1840, for such purposes. I mention this circumstance in order to state that I do not claim the depositing of gold or of silver on to metallic surfaces, excepting when the process is so conducted that the moulds or models used in producing any articles in gold or silver according to my invention, may be removed by heat or otherwise from the deposition of gold or of silver, and thus obtain the articles desired in gold or in silver, in place of producing such articles by casting or by pressure or hammering or stamping in dies or shapes, as heretofore practised. The shapes of articles made in gold and silver for ornamental household and other purposes being so various, it will not be necessary for me to enter into a description of the formation of moulds or models

for every article, as a description of the means pursued in manufacturing a few articles of gold and silver, will enable the workman to make suitable moulds or models for other articles, which he may desire to make of gold or silver, and to facilitate the workman in understanding my invention. I would state that I prefer to use the following solution of gold, when articles of gold are desired to be made according to my invention :—

Take one ounce of pure gold and dissolve it in aqua regia, evaporate the same to dryness upon a sand bath, then add two gallons of water and sixteen ounces of prussiate of potash (cyanide of potassium). I use this solution at about 120 to 130 degrees of Fahrenheit, and in combination with electric currents, as hereafter described. And when articles in silver are desired to be made according to my invention, I prefer to employ the following solution of silver :—

Dissolve one ounce of pure silver in nitric-acid, and precipitate the same, by the addition of lime water, as oxide of silver: having well washed this oxide, add two gallons of water and one pound of prussiate of potash (cyanide of potassium); when wax moulds or models are used I prefer to use more water. I use this solution cold and in combination with electric currents, as hereafter described; but I do not confine myself to such solutions, as others may be employed, my invention not relating to the mode of preparing suitable solutions of gold and of silver to be acted on by electric means, to obtain depositions on moulds or models in the carrying out my invention.

I will now proceed to describe the kinds of moulds or models which I prefer to use in carrying out my invention, which are either of metal, or have metallic or electric conducting surfaces produced thereto, where the deposition of gold or of silver is to take place. I shall divide my description of these moulds or models into two classes, first, those where the required deposit or article

is produced within them ; and, secondly, where the deposit is obtained upon or outside these moulds or models, and I have found the former more suitable to copy such articles as busts, figures, and drinking and other vessels, and the second more suitable for flowers, leafage, scroll work, and other purposes, where the pattern or ornament is more elaborate or complex. The materials I employ are the same for both description of moulds, and are either metallic or non-metallic ; if the latter, it should be understood, that they are in all cases when used, to be prepared upon their surfaces in such manner as to become conductors of electricity, and which is effected by a coating of bronze or other conducting agent, as is well known, and in practice, in obtaining electrotype impressions in copper. In order to produce a mould, within which I intend to deposit an article, I first have before me a perfect pattern of the subject required, and the form or substance of this pattern will generally influence the choice of the material to be used for the moulds. If the pattern be formed of metal or plaster of Paris, I prefer the metallic or fusible metals, hereafter described, or wax or stearine may be employed. If the pattern be of wax, or of a substance that will not bear the heat of the melted metal or, melted wax, or stearine, I use plaster of Paris in forming the moulds or models, and saturate them with tallow, and bronze the surface, as before directed.

In order to produce moulds to be deposited upon internally, I proceed as follows :—Having prepared a plaster model or mould in the usual way, in parts of the article to be made in gold or silver, I take the pattern with the plaster mould thereon ; I remove one of the pieces of the plaster mould and run into the space left vacant, melted fusible metal, or wax, or stearine, and thus obtain a portion of a mould, which I remove and replace the portion of plaster cast, and next remove another portion of the plaster cast, and run in melted metal, wax, or stearine

and thus obtain another portion of the mould in the material desired, and so on till I obtain a complete mould; these parts or portions of a mould are then bound together with wire or other material, and are to receive the deposit of gold or silver. If carefully performed, all the sharpness of the original pattern will be preserved, and the same mould may be employed to obtain a number of deposited copies.

Another method of producing articles in gold or silver from internal moulds, is as follows:—Having prepared a plaster mould as before described, and the pattern removed, I pour therein some one of the substances before directed: if I use wax or stearine, I prefer to have the plaster mould first saturated with warm water, and having poured in sufficient of the substance to form a hollow mould strong enough to bear handling, I keep the mould in motion until the wax or stearine be cold; I then remove the cast of wax or stearine. If I use a fusible metal I introduce a core of sand or of plaster of Paris (in parts if necessary), leaving a space between the core and the mould, into which space I pour the fusible metal. I now proceed to deposit upon the external surfaces of such models or moulds, a coating of copper, and when the same is strong enough to serve as the mould, I melt out the internal substance. I have now a copper mould in which is to be produced in gold or silver the article desired; and having made the same perfectly clean, and protected the outer surface with wax or clay, coated with a solution of caoutchouc, I proceed to deposit gold or silver therein, as hereafter directed; and when I have obtained a sufficient thickness, I remove the copper mould by dissolving the same, or by mechanical means. If I dissolve, I use muriatic-acid in a hot state, having colcothar (peroxide of iron) in combination with it; but as these moulds are destroyed after producing one copy, I sometimes use metal moulds made in parts, by depositing the metal by electric agency, so as to fit together and make a perfect mould, by which several of the

articles may be made of gold or silver ; I also sometimes use moulds or models (in parts when required) prepared or cast of brass or other metals, the surfaces being subsequently chased on ground, or highly finished and fitted together ; but these are only desirable where a considerable number of copies may be required of one article.

In order to produce moulds of the second description, or where the deposit required is obtained outside the mould, I use the same substances as directed for moulds of the first class. If fusible metals are used they may be cast in sand from patterns, as is practised for casting brass, silver, and other metals, care being taken to have the sand well faced, as is practised for fine castings, and the moulds dried and cooled before pouring the fusible metal. If wax or stearine are to be used, I employ plaster of Paris moulds to produce the mould or model, and I sometimes cast fusible metals for models or moulds in plaster of Paris moulds. Having obtained the desired mould or model, I proceed to deposit gold or silver thereon ; and when using these moulds I cause the deposition to proceed slowly, in order to obtain the external surface smooth. When I have obtained sufficient strength of deposit, I remove the internal core by heat or otherwise, according to the nature of the substance used for the model or mould. If after cleaning the same I require more strength of metal than I have obtained by this external deposition, I protect the outer surface by wax or clay and caoutchouc, as before explained, and proceed to deposit a further quantity within, in the same manner as directed for depositing within an inner mould, and this may be carried on more rapidly as a slight roughness of surface inside is seldom an objection.

I would remark, that I do not confine myself to the use of the materials above mentioned, for making moulds or models for receiving deposition of gold or silver by electric means, as other materials may be used ; but I believe those above mentioned, will be found best for all purposes.

The fusible metals I prefer for the above described purposes, vary according to the kind and size of the mould or model desired : I prefer No. 1, stated below, or No. 3, for fine work ; No. 2, and No. 4, for larger articles.

Fusible metal, No. 1.—Fourteen parts, by weight, bismuth, sixteen parts of mercury, and thirty-two parts of lead.

No. 2.—Four parts bismuth, four parts lead, one part tin, and one part mercury.

No. 3.—Two parts of lead, and one part bismuth.

No. 4.—Three parts bismuth, six parts lead, one part antimony.

I prefer to pour the fusible metals at as low a heat as they remain fluid ; and in order to do this I keep the same, if of No. 1 or No. 2, heated over boiling water, and Nos. 3 and 4, over a gas-burner, in a vessel with a tap or plug at the bottom, which will prevent any oxidized portion of the metal flowing upon the surface from injuring the cast. In some cases I make the pattern upon which the mould or model is to be cast in pieces, and finish or work it up to the desired design, the parts being so formed as to separate and be removed from within a casting produced on the outer surface. And in obtaining a casting or mould from such pattern, I place it, as a core in a hollow mould, and run the melted material between the pattern and the mould, and, when cold, I remove the parts of the pattern ; I thus obtain a hollow mould in one piece, and receive the deposition of gold or silver therein, and then remove the mould by heat or otherwise, depending on the material used.

The use of electric agency in precipitating metals being now well understood, it will not be necessary to enter into any description of the various means of obtaining it, further than to state that I prefer to use the compound or independent battery, by which the electric current is conveyed from the battery into an adjoining cell or vessel, containing the solution of gold or of silver, and also a

plate of gold or of silver to be dissolved during the continuance of the deposition. This plate may be made to surround the whole of the interior of the cell, where the deposition is taking place upon the moulds ; but when the deposition is upon internal moulds, I prefer to have a plate or wire of silver or gold introduced within the mould, and in connection with the negative plate of the battery.

Description of the Drawing.

Having thus stated the nature of the solutions of gold and silver which I prefer to use, and also the nature of moulds employed, I will proceed to describe, by aid of the annexed drawings, the means pursued by me in producing any article of gold or silver according to my invention, and in doing so I will suppose the article desired to be obtained is a vase, as represented in fig. 1, where A, represents a wire from the positive plate, in connexion with the mould, c. B, the wire from the negative plate, in connexion with B¹, which is a plate of gold or silver to be dissolved. E, represents a solution of gold or silver, within and without the model or mould, c.

In fig. 2, c, represents a mould or model of a branch, upon the external surface of which the deposition of gold or silver is supposed to be proceeding. B¹, a plate of gold or silver surrounding the model or mould, c, and immersed in a solution of gold or silver, E.

In fig. 3, F, represents a copper deposited model or mould, within which the deposition of gold or silver is desired to be obtained. The other letters of reference are used to denote the same things as in fig. 1. Having produced the article desired, in gold or in silver, if it be a bust, or figure, or ornament, and requires to be of greater strength than it is desired to obtain by a thickness of gold or silver, I strengthen the article by causing a deposit of copper or other metal, by electric means, within

the article of silver or gold, or I fill the article of gold or silver with fusible metal or other material.

Having thus described the nature of my invention, and the manner of performing the same, I would wish it to be understood, that what I claim as the invention, secured under the above recited letters patent ; is, first, the mode of manufacturing articles of gold and silver by depositions thereof, by electric agency in or on suitable moulds or models, which may be removed from the articles of gold or silver when the same have been formed, as above described.

Secondly, I claim the mode of manufacturing articles of gold or silver on or in metal moulds or models, which are deposited by electric means, such moulds or models being afterwards removed, as described.

Thirdly, I claim the mode of manufacturing articles of gold or silver by electric deposition on or in moulds or models, when such moulds or models are removed by heat or by solution.

Fourthly, I claim the mode of manufacturing articles of gold or silver by electric deposition, in or on moulds or models made up of parts.

Fifthly, I claim the mode of strengthening articles of gold and silver produced in or on moulds by electric depositions, by introducing a baser metal within them.—In witness whereof, &c.

ALEXANDER PARKES.

Enrolled September 29, 1841.

Specification of the Patent granted to WILLIAM WILKINSON TAYLOR, of Barrowfield House, West Ham, in the County of Essex, Gentleman, for Improvements in Buffing Apparatus for Railway Purposes.—Sealed February 1, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—
My invention relates to the application of felt in a series of layers in the constructing or making buffing apparatus for railway purposes; and in order that my invention may be readily understood, I will proceed to describe the best means I am acquainted with for performing the same. I take any of the felting fibres, but in preference, I employ ox and cow hair, and I make sheets of felt, as is well understood, of the size and shape desired; and supposing I am going to pad the buffing apparatus now in use, by the application of felt according to my invention, I form holes in the buffer-head or surface, and punch holes in felt to correspond in position with the holes in the buffer-head or surface, which has heretofore been stuffed in a different manner, and as is well understood; and by means of such hole I attach any desired number of sheets of felt to the buffer-head by passing strong string or cord, either linen, woollen, or cat-gut, through the various layers of felt and through the buffer-head, and fasten the ends of the strings employed. I then cover the padding thus obtained to the buffer-head with leather or other suitable material, which should be as waterproof as possible, and in stuffing a buffer-head, such as is now used, a series of layers of felt equal to twelve to fourteen inches will be sufficient. But the elasticity of felt, when so combined into a series of layers, is such that I prefer to dispense with the use of the ordinary springs and apparatus now used, and simply depend on the elasticity offered by applying a buffing apparatus to each carriage, such as is shewn in

the drawing at fig. 1, and to the locomotive-engine an apparatus, such as is shewn in fig. 2, of the drawing. Each of these apparatuses consist of a series of layers of felt, as is shewn, attached as before described, to a board or surface, *a, a*, which is a of length to pass from side to side of the railway-carriage, and is affixed to the side framings thereof by means of the projecting bars, *b*, which pass through sockets (fixed to the side framings of a carriage,) and they are securely held by keys. The only difference of the buffing-apparatus used between the railway-carriages and the buffing-apparatus attached to a locomotive-engine, is, that there is a space cut away, or left vacant, as is shewn, and there is a hole through the board or surface, *a*, and through the layers of felt, in order to allow of the passage of the ordinary coupling irons, as will be readily understood on examining the drawing. The buffing-apparatus being thus formed, is to be covered with leather or other suitable material which, as before stated, should be as waterproof as possible. I would remark, that I do not confine myself to any particular shape of buffing-apparatus, nor to the mode of attaching the series of layers of felt by means of strings, as described, as variations may be made, so long as the apparatus consists of a series of layers of felt suitably combined together. And I would also remark, that in making sheets of felt for the purposes of my invention, I usually make them about three quarters of an inch thick, and so that the sheets will weigh at the rate of eight ounces per square foot, but I do not confine myself thereto. But I hereby declare, that what I claim as the invention, secured by the present letters patent, is, the mode of constructing buffing-apparatus for railway purposes by applying felt in a series of layers, as herein described.—In witness whereof, &c.

WILLIAM WILKINSON TAYLOR.

Enrolled August 1, 1841.

Specification of the Patent granted to JOHN JUCKES, of Lewisham, in the County of Kent, Gentleman, for Improvements in Furnaces or Fire-Places.—Sealed September 4, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My invention relates to a mode of arranging and combining the fire-bars of furnaces, and in such manner that by producing a chain of fire-bars, and by causing the parts successively to come into and go out of action, the fuel will be carried into the furnace, and progressively be brought into a state of combustion, the products evolved from the fresh fuel being ignited and burned before they arrive at the bridge or entrance into the flue of the chimney, by which means, the fuel employed will be most advantageously consumed, and from the circumstance of the parts of the fire-bars remaining only a short time subject to a high temperature, they will not be liable to be quickly destroyed.

Description of the Drawing.

And in order that the invention may be most fully understood, and readily carried into effect, I will proceed to describe the drawing hereunto annexed, in the various figures of which the same letters are used to indicate similar parts. *a, a, a, a*, represents the interior of the furnace, the upper and side parts of which will be constructed according to the purpose to which the furnace is to be applied. *b*, is the bridge and entrance of the flue into the chimney or shaft. The fire-bars, *c, c'*, are made into an endless chain by means of the axes, *d, d*, which pass through the holes, *e*, of the bars, *c*, and through the holes, *e'*, of the outside bars, *c'*: and the ends of the axes, *d*, are rivetted. The forms of the bars, *c, c'*, which I prefer to use, being shewn separately as well as combined

into a chain, the nature of this construction will readily be traced in the drawing. And it will be seen that the outer bars, c^1 , are supported in their movement by rollers, f, f , so that the portion of the chain of bars within the furnace will be supported by such rollers, f , which turn on suitable axes at each side of the furnace as is shewn. And it will be seen, that the various bars, c, c^1 , are so placed on their axes, that the bars are what is called break-joint, by which means, as they go out of action by passing out of the furnace in passing over the back chain wheel, the parts so separate, that, in the event of any clinker or hard cinder having formed on or between the bars, the same will be broken off, and thus will the bars at all times be kept free, and allow of a free passage of air between them when within the furnace. g, g , are two chain-wheels moving on axes at either end of the furnace, the carriages or gudgeons of the front chain-wheel being moveable in the framing, and adjustable by the screws and nuts, h, h . The chain of fire-bars is carried by a frame, i, i , which is capable of being moved into and out of the ash-pit, by means of wheels, j, j , which run on rails, k, k : by this arrangement, the fire-bars can be quickly removed at any moment in the event of requiring any repair, or for any other purpose. On the axis of the front chain-wheel, g , is affixed the cog-wheel, l , which takes into, and is worked by, the pinion, m , which is affixed on an axis, n , which has a square end to receive the lever, o , which has a ratchet-wheel, p , with a hollow axis moving through openings of the two side-plates, p^1 , of which that end of the lever, o , is composed; and q , is a spring-click: hence, when the lever, o , is applied to the square end of the axis, n , the lever, o , may be moved in one direction without operating to turn the axis, but in moving in the opposite direction the axis will be turned. r , is a hopper into which the fuel is fed, and a constant supply is kept therein. s , is a sliding-door suspended by chains, t , and counter-balanced by the weight, v : by this arrangement, the quan-

tity of fuel carried into the furnace can be regulated with great nicety, for according as the door is raised more or less above the fire-bars, *c*, there will be more or less fuel carried in by the moving bars.

And it may be remarked, that I use small coal ; indeed, such is the peculiar effect produced by this mode of feeding a furnace with fuel, and of burning fuel, that the "slack" or small of coal may be consumed with great advantage. When the furnace is in use, I cause the bars to be moved about a foot every twenty minutes, by which it will be found that a very excellent fire will be maintained, and no smoke will be evolved from the chimney.

I would remark, that although I have shewn the exact particulars of construction of every part, I do not confine myself thereto, so long as the peculiar character of the combination of a series of fire-bars into a chain be retained, whereby in using the same, the various parts progressively pass into and out of action as has been explained. *u*, is an inclined plate of iron at the front part of the furnace, placed under the chain of bars, and any small coal which falls between the bars before they become caked and ignited, will slide down such inclined plate, and may be removed from time to time and supplied again into the hopper.

The nature of the various figures of the drawing being written thereon, will not require to be repeated here. And I wish it to be understood, that what I claim is the mode of constructing furnaces or fire-places by combining fire-bars into a chain, by which the parts may be changed in their position from time to time, and progressively go into and out of action as above explained.—In witness whereof, &c.

JOHN JUCKES.

Enrolled March 4, 1842.

Specification of the Patent granted to WILLIAM JEFFERIES, of Holme Street, Mile End, in the County of Middlesex, Metal Refiner, for certain Improvements in the Process of Smelting or Extracting Metal from Copper and other Ores.—Sealed May 22, 1839.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—The object of my invention is to obtain copper and other metals from the ore in a more economical manner, and in a better state or quality, than can be effected by the methods or processes commonly employed, and consists in an improved process of calcining or roasting and preparing the ores for the after process of smelting, and also in the use and application of novel or improved constructions of roasting or calcining furnaces, ovens, or chambers, for effecting such calcination of the ores. I will first describe my improved construction and arrangement of roasting or calcining furnace or oven, and then my improved process connected therewith, and mode of preparing for smelting.

Description of the Drawing.

Fig. 1, is a vertical section of one of my improved constructions of calcining furnaces, shewing two ovens, or roasting chambers, connected in one building, but they may be constructed separately, or three or four, or any other number, side by side.

Fig. 2, is a horizontal section taken through the same in the line, *a b*, shewing the flooring of the ovens or calcining chambers; and,

Fig. 3, is another horizontal section, taken in the line, *c, d*, and shewing the flooring of the upper chamber.

These improved furnaces may be constructed of any form that shall be considered desirable, either square, round, octagonal, or of any other figure, though I prefer the

form shewn in the drawings, as it is most convenient. The furnace consists of the walls, A, A, which are built of brick-work or stone in the ordinary manner. The furnaces are divided by the two horizontal floors or partitions, B, B, and C, C; the floor, B, forms the roof of the ash-pit, D, as well as the floor of the roasting or calcining-chamber or oven, E; and the partition, C, forms the roof of these ovens or chambers, E, as well as the floor of the upper chambers, F. The smoke and vapour arising from the roasting of the ore is allowed to pass through the openings, G, G. In these chambers, F, the vapours become condensed, and the sulphuric-acid and other heavy parts of the vapour may be collected in suitable vessels, by which the deleterious matters usually thrown off into the atmosphere will, in a great measure, be arrested, and their unpleasant consequences prevented. The roof or covering, H, H, of these upper chambers, F, F, are formed of arched brick or stone-work, as shewn in fig. 1; and the uncondensed parts of the vapour or smoke may be allowed to pass off by the chimneys, I, I, or by any other suitable apertures. The lower compartments or ash-pits, D, are furnished with a damper, J, J, which may be opened or closed according to the draft required through the furnaces during the process of calcining or roasting of the ores. These doors also serve for the removal of the ashes and ores falling from the chambers above. It will be seen, that the horizontal partitions or floors, B, are pierced with a number of small apertures for the admission of air from the ash-pit, D, D, to the chambers or ovens, E, E, in order to support the combustion of the coal or fuel mixed with the ore, and thereby effect the roasting or calcining of the charge of material. The oven or chamber, E, are also furnished with doors, K, K, for the introduction of the fresh charge of ore and fuel, and also the removal of the same, when the process of roasting or calcining is completed. The ovens or chambers are also furnished with other smaller apertures, L, L, for the pur-

pose of allowing the attendant to inspect the state of the operation and the degree of roasting or calcination going on. These apertures are fitted with doors or covers to be opened or closed at pleasure. The apertures, G, G, leading from the ovens to the chamber above, are supplied with dampers, by means of which the draft or passage of the vapours from the ovens can be regulated at pleasure. .

Fig. 4, is another vertical section taken through two furnaces built together, but with only the upper condensing-chamber, F, which in some cases may be preferred to those having a separate chamber to each furnace. In this instance the roof, H, is constructed in a different manner to the former, and may be of iron tiled and plastered, or it may be roofed in any other suitable way. I would remark, that I do not confine myself to any particular shape of the apertures for the admission of air through the flooring of the roasting ovens or chambers, as these may be formed by leaving small spaces between the fire-bricks used for the flooring, or by piercing holes through them (when in the clay state) before they are burnt.

Having described the construction of my improved calcining or roasting furnace, I will now proceed to explain the improved process which I use in conjunction therewith (that is to say) :—The ore is taken in the raw state, in large or small pieces, as it may be brought to the smelting works, and is to be mixed, in the first place, with a sufficient quantity of fuel, as coal, coke, or anthracite-coal, to effect the calcination of the ore. The quantity of fuel employed in connection with a given weight of ore, must vary from 100 to 300 weight of fuel to one ton of ore. The more sulphurous the state of the ore, the less coal or other fuel is required for this purpose. The mixture of the fuel and ore is then put into the calcining-furnace or chamber, E, with a quantity of wood under it capable of igniting the mass of fuel. The whole of the materials are then set on fire, in which situation the ore

is to remain in the furnace, subjected to the action of a slow heat for a space of time sufficient to complete the operation; say for four, five, or six days, according to the quality of the material. The charge is then to be drawn out of the chamber and wetted, and after laying in a wet state for three or four days or more, it is to be mixed with a quantity of lime, common soda, or any other alkali that may be found more convenient for use. The calcined ore and the alkali is then kept in a wetted state for three days or more, as the nature of the ore may require. If the ore be mixed with common unslacked lime, it will require about 200 weight to the ton of ore; and after the ore has been subjected to this process, it is ready for the after process of smelting in the common smelting or reverberatory furnace. If common soda be employed, about half a hundred weight of the alkali will be found sufficient for every ton of ore.

Lastly, I desire it to be understood that I claim as my improvements in the process of smelting ores, first, the use and application of the construction of furnaces, as described above; and,

Secondly, the method of submitting the ore to a slow operation of calcining or roasting by the employment of a small quantity of fuel kept in a state of slow combustion by the regulated admission of atmospheric air; and after such roasting, allow the ore to remain for several days in a mixture of alkali and water exposed to the atmosphere, when it will be found ready for smelting in the reverberatory furnace, the metal being in a much more advanced state in its progress towards purity than by any of the ordinary modes of smelting.—In witness whereof, &c.

WILLIAM JEFFERIES.

Enrolled November 22, 1839.

Specification of the Patent granted to CHARLES DE BERGUE, of London, Merchant, for an Improvement in Axletrees and Axletree-Boxes.—Sealed August 21, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention consists in a new description of axletrees and axletree-boxes suitable for carriages, coaches, carts, and other purposes, constructed on a principle combining greater simplicity, safety, and cheapness, together with the advantage that the wheels can be much more readily taken off for the purpose of cleaning and lubricating, and replaced, than with those now in use; and the manner in which the same is constructed and carried into effect will be seen by reference to the annexed drawings and the following description thereof, in which the same letters of reference are used to indicate the same parts in each figure.

Description of the Drawings.

Fig. 1, is a side view; and,

Fig. 2, a section of one description of axletree and axletree-box on the above principle; and,

Figs. 3 and 4, are detached parts, which will be afterwards referred to. In these figures, A, represents one end of the axle or shaft on which the box or bush revolves. B, is the box or bush; and C, a small case or chamber screwed into the end of the box for the purpose of holding a supply of oil, or similar liquid, for effectually lubricating the working parts; towards the middle of the box or bush, B; a small recess, b, is made in the axle to contain oil; and in the box itself, the recess, a, is also provided for the same purpose. The shape of the axle, A, as seen at fig. 2, represents two shoulders or circular parts of an increased diameter, D and E, between which a divided nut, which may be made of iron, steel, bell metal,

brass, or any other suitable metal, is placed. A plan of this nut is seen at G, G, fig. 3, and the interior construction at fig. 4, where it is so formed as to fit accurately to the axletree, A, in the space between the parts D and E. The outside of this divided nut is cut with a strong screw-thread, which is received into a similar thread in the interior of the box, B, as seen at g, g, fig. 2, so that when the two parts of the divided nut are placed together on the axle between the shoulders, D and E, as seen at fig. 1, and the box, B, screwed home, it is held in the proper position, and the nut and box or bush, forming as it were a single body, revolve freely together on the axle, A, thus most effectually securing the wheel from the possibility of coming off when working, as it is dependent on the shoulder, D, which forms part of the solid axle, A. It will be observed that the screw of the divided nut, G, G, is cut in the opposite direction to that in which the box is designed to turn, so that the subsequent rotation has a tendency to tighten the screwed part, and keep the nut firm in its place when moving, and that the escape of the oil or other lubricating liquid is secured in a small collar of sponge or other material used as packing, which is let into an accurately turned groove cut in the part, E, as seen at D, fig. 2. When it is required to remove a wheel, to clean the box or axle, or for any other purpose, the divided nut must be held stationary by a key or spanner, and the wheel and box, B, turned backwards until the screwed part of the nut, G, is relieved from the box, B. The wheel and box can then be removed as well as the divided nut; and when cleaned and oiled, replaced in the same manner. Although I have shewn but one form of axletree in the annexed drawing, which is considered well arranged for ordinary purposes, it will be obvious, that the form and proportions of such axletrees may be variously modified and varied according to the purpose to which they are to be applied; and I do not confine myself, or do I claim these or any other form of parts which may be adopted;

but what I do claim as new and never before used in this kingdom, to the best of my knowledge and belief, and in which this improvement consists, is the divided nut, *g, g*, and the screwed part of the axletree-box, *g, g*, as applied to axletrees and axletree-boxes, for the purpose hereinbefore described; and I deliver this as my true and faithful specification of the same.—In witness whereof, &c.

CHARLES DE BERGUE.

Enrolled February 21, 1842.

Specification of the Patent granted to MILES BERRY, of 66, Chancery Lane, in the County of Middlesex, Patent Agent, for certain Improvements in the Manufacture of Prussiate of Potash and Prussiate of Soda.—Sealed January 21, 1840.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—The invention of certain improvements in the manufacture of the prussiate of potash and prussiate of soda, and for which the above in part recited letters patent was granted, has been communicated to me in the following words:—Hitherto the prussiate of potash has only been obtained by incurring the loss of a considerable quantity of azote or nitrogen gas, and, when combined with carbon, forms cyanogen, the generator of Prussian blue. This azote is evolved by the distillation of organic substances contained in certain vegetables, animal oils, &c.; but it is obtained in larger quantities by the calcination of animal substances, such as horn, blood, muscular flesh, skin, &c. Sometimes the azote is evolved under the form of subcarbonate of ammonia and introgeneous oils. To avoid the loss generally incurred, which is of serious consequence in the manufacturing of prussiate, it is necessary to treat the primary matters in a different manner, so as

to collect the azote, which escapes during the distillation, and to make it enter into combination with carbon, iron, and potassium; and, moreover, to convert to useful purposes the azote, which has adhered to the carbonaceous residuum. This end is obtained as follows:—Instead of collecting the sub-carbonate of ammonia in or by an absorbent medium, it is made to pass through a quantity of charcoal, iron, and potash, placed in an iron tube, kept at a red-heat. The carbon on the one part decomposes the sub-carbonate of ammonia, and treats bi-carburetted hydrogen, and at the same time gives up part of it to the azote, which proceeds from the decomposed ammonia, and thereby forms cyanogen, which, in its turn, combining with the reduced potash, forms cyanoferruret of potassium, or prussiate of potash. To obtain the most complete reaction, the operator must divide or reduce the ingredients constituting the decomposing compound. In order to effect such a division, either of the following means may be used, according to circumstances.

First method, or *viâ humida*, is to reduce the charcoal into fragments of about the size of a nut or walnut; then dissolve the potash, or the salts of potash, such as carbonate or nitrate, in an aqueous solvent, in urine, for example, if a great quantity can be obtained, and at little cost, otherwise use common water; with respect to iron, it is to be rendered soluble by the addition of an acid, such as nitric or acetic-acid. These preliminary preparations being made, which are simple, the solution of potash and nitre is then to be poured on the charcoal, the saline lye is absorbed very soon, then pour in the solution of iron, stir the mixture with a spatula, evaporate the water which has been used as a dissolvent, taking care that the compound does not become calcined during the operation. The compound being dry is again pulverised and introduced into cast iron tubes, which I shall hereafter mention. The other, or the dry method, has for its object the substitution of a mechanical division,

instead of an anatomical or chemical one. To effect this, introduce the potash, nitre, and charcoal, into a barrel with iron-filings: place in the barrel cannon-balls. The barrel is then to be made to revolve on its axis, and the balls will grind the compound and reduce it to small fragments, which will thereby be mixed together. The compound is then removed from the barrel and introduced at once into cast-iron pipes, or kept for use in a dry place. It is not of importance to name any particular proportion in the ingredients employed, as they may be varied according to the will of the operator; but I will state, for example, such proportions as have been found to give satisfactory results. When the dry process is employed, with the mechanical divisions, take of ordinary potash 20 parts, saltpetre 10 ditto, iron-filings 20 ditto, coke or ordinary charcoal 45 to 55 ditto, dried blood 50 ditto, and proceed as above stated. For the wet process, or the chemical division, take of ordinary potash 30 parts, saltpetre 10 ditto, acetate or nitrate of iron 15 ditto, coke or ordinary charcoal 45 to 55 ditto, dried blood 50 ditto, and proceed as described. Whatsoever be the mode preferred, either the wet or the dry process, for obtaining or effecting the mixture, the compound ingredients must be introduced, when perfectly dry, in a series of pipes, connected together and contained in a furnace similar to that used for the manufacturing of carbonated hydrogen-gas or coal-gas employed for illumination.

Instead of placing the pipes in a horizontal position, which renders it somewhat difficult to introduce and draw out or remove the charge, they may be placed vertically; but then the treating is more expensive. When the pipes are placed vertically, care must be taken not to pulverize completely the dry compound, in order that the gases may be able to circulate through them without raising the internal pressure to a dangerous pitch. The animal matter is placed in a separate compartment, and in a cast-iron retort, which is connected with the horizontal or

vertical pipes. On this retort is placed a safety-valve, to prevent accidents which might arise from any obstacle obstructing the circulation of the gases through the pipes. The heating of the furnace should be effected as follows :—It is very essential to bring to a red-head the pipes containing the compound or mixture, before any fire is placed or introduced under the retort, in order that, from the beginning of the operation, the decomposition of the gases may take place. The gas which is evolved by the decomposition, is inflammable when issuing from the pipes, and the colour of the flame will be a sufficient indication of the progress of the operation. The colour in general differs but little from that of the heated cast-iron pipes in the furnace. When this colour approaches to pink, the re-action is almost complete, so that very little, if any, ammonia has escaped decomposition. When the jet of gas becomes smaller and clearer, while a good fire exists under the retort, one may consider that the operation is near its end, the animal matter is reduced into azotated or introgenated charcoal, which is used at present for the manufacturing of prussiate of potash, and which is still to be employed in the same manner, and treated as usual. On the other hand, the azote ammonia and other gases, by combining with the decomposing substances contained in the pipes, have been transformed into prussiate of potash. The charge must then be rapidly removed from the pipes, and it being at a red-heat, should be thrown at once into water to extinguish it rapidly. The whole must be well stirred and allowed to settle; the clear liquor is then to be drawn off; and this is the strongest solution. Warm water is then to be poured on the carbonaceous residuum, and well stirred and allowed to settle, and then the liquid drawn off. This operation is continued until the residuum be exhausted. The strong solutions are to be evaporated, allowed to crystallize, and the prussiate extracted according to the old process. The solutions which are not crystallizable, contain carbonated potash,

which is extracted therefrom, to be employed again. The same is done with reference to the residuum of charcoal and of iron. All this residuum is carried to the following operation, to which is added the animal charcoal, furnished by the first operation by the calcination of animal matter. Besides this animal charcoal, a proper quantity of other or fresh charcoal is added, in order to preserve, as far as possible, the same proportions in the decomposing mixture. After some operations it may be found, that the animal charcoal is completely deprived of azote; a portion of it is, in such case, to be laid aside, and a proper quantity of fresh animal charcoal to be substituted. It will thus be seen, that after a little while the coke or vegetable charcoal first employed is completely set aside, and the whole operation is effected by two kinds of animal charcoal, of which one is almost deprived of azote; and the other contains a great quantity of the same, though it is not essential to adopt exclusively one system of apparatus, as the operation is more chemical than mechanical.

I will, nevertheless, describe an apparatus for carrying the invention into effect, in order that the *modus operandi* may be better understood.

Description of the Drawings.

Fig. 1, A^a, B, C, D, is a horizontal section of a furnace constructed to receive four elliptical pipes from five to six feet long. The largest diameter may be supposed to be eighteen inches, and the smaller diameter ten inches. The furnace is arched in the part, A, C, B, in order to reverberate the heat and drive it back on the pipes, w, w, w, w. These pipes are placed in a position which is considered essential, they being placed on the focal-plane, E, F, of the elypsoïd. a, b, c, d, represents the grating or bars of the furnace to be heated with coal or coke. 1, 1, is the pot or retort shewn in figs. 2, 3, 4; this pot or retort is placed in a separate compartment, as seen in fig. 2.

Fig. 2, vertical section taken through the line, G, H, of fig. 4. In this figure are shewn the pot or retort, I, and the pipe, w^l. κ, κ^1 , is a connecting tube from the retort and the elliptical pipes. This tube, κ, κ^1 , is seen at fig. 3, and enters, at s, into the pipe, w, and, at s¹, in the pipe, w¹¹¹. In the section, fig. 2, the shape of the tube, κ, κ^1 , will be better seen; also its cocks, u and u¹, and the part, s, s¹, by which it is connected with the pipes, w and w¹¹¹. l, fig. 2, indicates a safety-valve. s, is the cover of the pot or retort. L, is the ash-pit; and a, c, the door of the furnace. x, x^d, is an open space roofed over, or a kind of shed close to the furnace, and under which the pipes are emptied or charged. The arrows indicate the direction of the current of heat. This current traverses the intervals left between the pipes, and ascends behind them, passing through the aperture, j, in the brick-work. This aperture, j, is provided with a valve or damper for closing it, as required. The heat passes through this aperture, and strikes against the sides of the pot when the valve is open. Another valve, f, g, must also be opened to expose the pot or retort to the direct action of the fire. The smoke escapes by a lateral passage into a chimney, N. At i, is placed a small valve, to prevent the smoke passing immediately through the aperture, j, into the chimney. It must also be remarked, that there is a direct communication between the chimney and that compartment of the furnace which contains the pipes, so that the heat reflected from v and v¹, strikes on the pot or retort only when the pipes, w, w^l, w¹¹, w¹¹¹, are sufficiently heated.

In fig. 3, is shewn an inclined plane, M, M¹; also represented in fig. 2; and the junction-tubes which connect the four pipes and their gas burners, z, z, with their cocks, m, m. r, r, r¹, r¹, r¹¹, r¹¹, r¹¹¹, r¹¹¹, are covers closing the pipes, and having holes formed in them, these holes are shut by the stoppers, e, e¹, e¹¹, e¹¹¹. Whether the pipes are placed in the vertical or horizontal position, it is always proper to be able to change the direction of the

current of gas ; this is easily done, by closing during one hour (if the operation is to last two hours) the cocks u , m^1 , and opening those, u^1 , m ; then the gas passes through u^1 , in the branch, k^1 , and enters, w^{III} , and passes through q , into w , through p , into u , and through o and w , and finally escapes by the burner, z . During the following or other hour, the cocks, u^1 , m , must be closed, the cocks, u , m^1 , being opened, the current then goes from u , into k , w , w^1 , w^{II} , w^{III} , and escapes by the burner, z^1 , where it may be ignited. The changing of the direction of the current dispenses, to a certain degree, with the labour required for stirring with the spatula the matters contained in the pipes ; nevertheless, it is necessary, from time to time, to pass an iron-rod or poker amongst the substances contained in the pipes. It is for this purpose that apertures are formed, so as to be easily opened and closed.

I will here remark, that in the foregoing specification I have only mentioned the operation, with reference to potash, to obtain prussiate of potash. It is quite clear that the same process is applicable to soda ; and when the above mentioned ingredients are employed, soda being substituted for potash, the result will be prussiate of soda.

Finally, I would remark, that whatever be the apparatus employed, it is necessary it should be of a sufficient thickness to resist the action of a continued ardent heat, and an internal pressure of one and a half atmospheres, while the operation is performed—In witness whereof, &c.

MILES BERRY.

Enrolled July 21, 1840.

Specification of the Patent granted to JOHN GEORGE TRUSCOTT CAMPBELL, of Lambeth Hill, Upper Thames Street, in the City of London, Grocer, for Improvements in Propelling Vessels.—Sealed June 19, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My invention of improvements in propelling vessels, consists in the application of curious levers or shanks with guides, or levers without guides, by means of springs and propellers to be worked under water, and whose combined actions are a series of inclined planes moving between two parallels, thereby producing a very powerful reciprocating undulatory movement, with the least resistance possible, it being only the thickness of the propellers. And the only place where they can be worked with ease and beneficial effect, is in a hole in the after part of a vessel, immediately before the stern post. Now to distinguish this from all others, on account of its peculiar actions, being the nearest approach to nature, and consequently obtaining the greatest velocity, I call it the whale-tail or fluke-propellor. The experimental boat "Aerolite," which is sixty-nine feet long, and nine feet four inches beam, is fitted with my propellers, made from the following drawings.

Description of the Drawings.

Fig. 1, is the elevation; and,

Fig. 2, the plan. The letters and figures represent the same parts wherever they occur. A, the frame, with a fixed centre, z. B, the starboard lever, or shank, with the guides, a, b. c, knuckles with the principal propellor, d, attached, connected to the centre, e. f, a rod connected to the shank at g, and at the principal connecting-rod, h; this is for the forward propelling motion: and for the back propelling motion, i, is the

larboard lever or shank with guides, *c, d.* *j*, knuckles with the back propellor, *k*, attached, connected to the centre, *L.* *M*, a rod connected to the centre, *N*, and at its principal connecting-rod, *o.* *p, q,* and *r*, are brackets or stays, to keep each propellor in a horizontal position, when reversing the motions.

Fig. 3, is the end elevation of the frame, *A*, looking from the bows towards the stern. *z*, the fixed centre. *1, 2, 3*, are washers; the open spaces represent the situation of the starboard and larboard levers or shanks. *4*, section of the keel. *5*, section of the fore and aft timber to receive the upper part of the frame, the frame being bolted to it, likewise to the keel. The plates, *6, 7*, are bolted through the keel and to the frame, the edges of the frame are bevelled, to present the least resistance to the water.

Fig. 4, is a plan of the frame.

Figs. 5, and 6, represent the elevation and plan of the starboard lever or shank, shewing the three centres, *k, z, g*, which form a right angle; likewise the guides, *a, b*, which is also a right angle, and is produced by making each at an angle of 45° , from the line, *z, k*, their distance from *k*, being found by drawing tangents to a circle whose diameter is equal to the thickness of the propellor.

Figs. 7, and 8, represent the elevation and plan of the larboard lever or shank, shewing the three centres, *L, z, N*, likewise the guides, *c, d*, whose angles and guides are found in the same manner as in the starboard lever or shank, but inverted.

The actions of the propellers are these. When the principal connecting-rod, *n*, which is moved in guides, and through a stuffing-box, in the baulks head, and has motion given to it from the engine, and which is communicated to the rod, *r*, also to the lever or shank, *B*, the point, *G*, will move upon the centre, *z*, until it meets a line drawn through *z, k*, which determines the length of stroke of the principal connecting-rod,

н, and likewise gives to the propellor, the actions of a series of inclined planes, while passing from the upper to the lower parallel, which is fully and accurately shewn in the diagram, fig. 9; and reversely when passing from the lower to the upper parallel, as shewn by the dotted lines in fig. 9. The back motion is worked similar, but reversed.

The other method of applying this principle of propelling, is by means of springs instead of guides, placed securely upon that part of the lever or shank which is from the fixed centre, z, to the centre, x. These springs are intended to clasp the propellers similar to the knuckles as at c, and g; their flexibility being capable of producing the same actions as guides, a, b, and c, d. The propellers are formed of boards, and bound with iron straps, as shewn upon the plan, fig. 2.

Now having fully explained my principle of propelling to the best of my knowledge, I wish it to be understood that I do not confine myself from a right line to any particular angles, in the construction of the levers or shanks and guides, neither to any particular method in constructing the propellers, nor any particular method of working the propellers, that is, whether horizontally or vertically, so long as the principle is retained. But what I claim as new, is first, the levers or shanks, having three centres with guides, and the actions of the propellers by means of these levers, with guides to any distance between parallels, which may be required.

Secondly, I claim the application of springs, to be used instead of the guides, as in the manner before described.—In witness whereof, &c.

JOHN GEORGE TRUSCOTT CAMPBELL.

Enrolled December 19, 1841.

Specification of the Patent granted to GEORGE JOHN NEWBURY, of Cripplegate Buildings, in the City of London, Manufacturer, for certain Improvements in Rendering Silk, Cotton, Woollen, Linen, and other Fabrics Waterproof.—Sealed May 13, 1840.

To all to whom these presents shall come, &c. &c.—My improvements in rendering silk, cotton, woollen, linen, and other fabrics waterproof, consist in an improved mode, manner, or method of rendering such fabrics waterproof, and is effected by using drying oils, and oil composition varnishes, or other suitable compositions for the purpose, in such a way that one side of the fabric, when finished, presents an appearance unimpaired, or but little altered, by the process of waterproofing, and therefore keeps its original appearance, or nearly so; and this I effect by applying siccative or drying oils and compositions, in such manner, that, when finished, the appearance of one side only of the texture is altered; that is to say, the oil or paint, or waterproof composition, coats or covers the one side, while it does not cover or injure the appearance of the other side, or but little so. And in order to make myself and my improved mode or method of waterproofing fabrics more clearly understood, I will first describe the same, and different modifications thereof; and then how I produce damask patterns or designs thereon.

I would here make the following preliminary remarks; *videlicet*, that there are several well known methods of waterproofing fabrics by means of siccative oils, or siccative compositions, such as I intend to apply for this purpose in my improved mode, manner, or method: for instance,—one well known method of applying drying oils, and oil paints, and oil varnishes, to textures, is to spread or cover the surface of the fabric with a thick or stiff coating of material, as a mixture of drying oils, metallic

oxides, and lamp-black, or other pigment or suitable body, and which is employed chiefly in the process of making floor-cloth, cable-baize, cart-covers, &c.; the other is simply by saturating the fabrics with the said oil or oil-paint, or oil-japan, and allowing it to dry, as in the manner usually adopted in the making of ordinary or common oiled silk. To preserve the original appearance of the fabrics on the one side, while the other shall be completely coated with the waterproof composition, has been a desideratum for a long time. Various plans have been tried to accomplish this object, such as wetting with water the fabric or texture intended to be waterproofed, before spreading the stiff oil colour, or waterproofing composition, on the same: as, for instance, in the making of oil-baize table-covers, where the ordinary process is to give the textures a coating, on the one side, of size or other gelatinous body, with a portion of treacle or other soluble matter intermixed with it, and afterwards spreading over the other side oil colour or varnish. Another well known process is the saturating the texture with size, colour, or strong starch or size, or such like matters, and then oiling or covering with varnishes the other side, by which means the capillary absorption, which the fabric would otherwise have, is overcome by the saturation, while the waterproof coating remains and dries on the other side. Another method is to mix gelatine, or other extraneous matters, with the oil or varnishes, so as to remove its straining or percolating properties at the time of applying the same to the textures; but these means are imperfect: for if stiff colour is used, and spread on one side, the more fluid portions of the mixture is withdrawn, and dries in stains on the other side of the textures, after the manner in which elaine will leave the stearine on pressing fat suet between bibulous paper; and if the texture to be waterproofed is saturated with water, then the oil, paint, or other compositions, cannot take a sufficiently firm hold of the side of the texture it is applied to, and

is still apt to go through the fabric, and shew on the other side, caused by the pressure necessary to spread so thick a material as must be used; and the texture must be kept saturated with aqueous matter until the oily substance is dry, and when dried it is of but little use as a waterproof, and is easily rubbed off, not having a sufficient hold of the fibre of the texture.

The improved mode, manner, or method, of waterproofing fabrics I employ, and which forms the subject of my improvements or invention, is, to saturate the texture completely with the composition I intend shall form the coating, covering, or waterproofing, on one side only, and exposing that surface only in such way to the action of the atmosphere, or artificial heat, that the said one side only shall become coated with a dry membranous substance or pellicle of the composition, while, during the process of drying, or coating or covering the said one side, the other, or reversed side, is wholly or partially protected from becoming dry or hardened, and which is effected by preventing the action of the atmosphere, or artificial heat, thereon. At this stage of the process, that is, when the one side is dry, and the other yet moist, from having been covered by other substances and thereby protected from the action of the air or heat, the moist or hardened side of the texture may be washed and cleansed or cleared on this said undried side, by means of spirits of turpentine, or other suitable liquid, and then hung up to dry, and, by evaporation, lose the odour of both the waterproofing material for the one side, and the cleansing medium for the other side: this process may be repeated, if the membranous stratum or pellicle left on the one side is not quite waterproof by the first operation, and the said waterproof coating may be thickened or strengthened afterwards, if thought desirable, by repeated coats of paint, oil, varnish, or other compositions, laid on by a brush or other means. I wish it, therefore, to be understood, that what I consider my claim

to these improvements, in rendering fabrics waterproof, is the saturating woven fabrics and fibrous textures, with siccative oils, oil paints, oil japans, oil varnishes, and other suitable compositions, and then drying the same thereon, as a coating or covering or pellicle on one side of the textures only, by various methods to be hereafter explained, at the same time keeping the other side in an undried state, and then washing or cleaning this other unhardened or moist side of the fabric or texture from the said siccative matters by means of spirits of turpentine or other suitable liquids.

Having stated the nature and object of my invention, I will proceed to explain my improved methods of preventing the one side of the saturated fabric from drying, and of promoting the drying of the other side, or that to be left coated or covered by a pellicle, and which I consider to be new and peculiar. I would here remark, that drying oils and varnishes, or siccative compounds, of which drying oils form an important part, it is known will "skim over," as it is commonly termed, or dry on the surface, while the under part remains in the liquid state, if in any quantity (as in a jar or vessel) for months, or even years. This pellicle I have found, by experiment, is very thin for several days; I determined to apply this effect of nature to the waterproofing of textures or fabrics in the following way:—First, I strained a portion of silk on a frame, and allowed it to float on a bath of drying oil, so as to be perfectly even with the surface, scarcely touching it without being immersed; in a few hours I took up the frame, the upper surface was perfectly dry or hardened, and coated with a thin pellicle or film of the oil: I then washed the free oil away from the underside with spirits of turpentine, and found the said coating or pellicle on the upper side firmly fixed on that side which had been exposed to the air, and the other side of the fabric not impaired, or but little so, in its appearance or colour. Therefore, one method by which my im-

proved mode, method, or process, may be carried into effect, is to use oil baths (about a quarter or half an inch deep will be found sufficient) of proper dimensions, to allow the frame containing the strained silk or fabric to float thereon, the upper surface of the fabric being left exposed to the action of the atmosphere, or artificial heat. Another mode or modification of process of carrying my improvements into effect is as follows: viz., by merely laying the saturated fabric on a slab of slate, or stone, or metal, or other surface or material, non-absorbent to oils or such matters; and this I consider a more simple and convenient method of effecting the objects of my improvements. The non-absorbent surfaces I prefer to use are tables of sufficient length and breadth for the fabrics intended to be waterproofed, and may be made of wood, and rendered non-absorbent by coating them with thin glue or varnish, or other suitable material; and when this coating is dry and hard, and seasoned, I take the waterproofing composition (that is, oil, or oil-paint, or other suitable matters), and, with a brush, cover the table evenly with a coating of the waterproofing composition, about as thick as a painter generally covers a wall or partition with oil-paint. I then take the fabric (it being previously coiled on a roller or round rod) and place it at one end of the table, and then unroll the fabric, so that it shall cover evenly the table or surface coated by the siccativ composition, and if the fabric is thin or of fine texture, as silk goods, it will be, by the paint already laid on the table or surface, completely saturated; should the fabric not lay evenly or close to the table or surface in all parts by merely rolling it thereon, I press it down, or cause it to lay in close contact by means of the hands of the workmen, and smooth out the wrinkles and air-bubbles or cells, by drawing the palm of the hand over the fabric, from the middle towards the sides, or by rollers or scrapers. By this means I also regulate the quantity of oil or siccativ composition, so as to get an even quantity

over the whole surface : should there be any pucker in the fabric, it may be overcome by straining the goods, and retaining the same by pins stuck through the selvages into the table. The time required for drying, or rather for obtaining, the pellicle surface, or thin coating or covering, depends on the nature of the oil, compositions, or waterproofing material, employed. In summer temperature, the ordinary boiled linseed-oil takes about ten hours ; but this may be ascertained by touching the surface with the finger from time to time, the drying process being continued until the outer surface of the material used loses its thickness or adhesiveness : or, in other words, until the pellicle is properly obtained. It is not positively necessary that the tables or surfaces should be placed horizontally, although I prefer to use them so, neither that the silk or fabric should be spread or laid on the upper side of the table, or non-absorbing surface ; for instance, in order to economize room, I sometimes make the table with both its under and upper surface prepared with the non-absorbent coating, and then spread the texture first over one side of the board, then around its end, which is properly shaped, and prepared with the non-absorbent coating, and continue spreading it over the opposite side, by which means I am enabled to effect the waterproofing of double the length of fabric, without occupying more space.

I would here remark, that by mixing whitening or pipe-clay, or flour, or other extraneous matters, with the oils or varnishes, or compositions, they may be thickened to such a degree as to prevent their running to the bottom edge of the table (or, in other words, following the inclination of their gravity). The table or surface may then be placed at any angle or perpendicularly, if desired, and the texture dried in this situation, which method will further economize space in the manufactory. Another variation of the mode or method of carrying my invention or improvements into effect, is to strain two pieces of

fabric on a stretching-frame, such as is commonly used by calico-printers and cloth-dressers, so that two of their surfaces are placed evenly and closely in contact together; and I then saturate or paint them with oil, or other waterproofing material: while in that position, I place the frame horizontally—if a thin drying oil, composition, or material, is used, and if the material is of sufficient consistence to prevent its running to the edges or ends, it may be placed perpendicularly. By this method of operation, the upper and under, or the outer, sides will become dry or hardened, whilst the two inner surfaces, or those in contact, will be left moist; or, in other words, the waterproofing material between those surfaces will not be allowed to dry or form a pellicle, by the action of the atmosphere, or artificial heat, applied; and when the two outer surfaces are dry on the pellicle surface, obtained thereon, the two pieces of fabric may be taken apart, and the siccative composition, which has not become hardened or dried, removed by means of spirits of turpentine, or other liquids. The object of my invention being to prevent the oil, or other siccative composition, drying on both sides of the fabric, I shall describe another way of effecting it; viz., by straining out the silk or fabric singly on or in a frame, then perfectly saturating it with any drying oils or paint, or other such waterproofing composition; and when it is beginning to set or harden on both sides,—that is, when the pellicle is just formed, and is yet extremely tender, I scrape the oil or composition from one side without disturbing the pellicle so formed on the other, and give the scraped side a new coating of oil or paint of some composition, which hardens or dries less rapidly than the other; for example,—unboiled linseed-oil. By this method the one side will get dry or hard, while the other remains moist, and capable of being washed clean by means of spirits of turpentine, or other suitable liquids, as before stated. Another modification of waterproofing by my improved process, is to strain

the fabric or texture, on or in a frame, in the way last described, and give it a coating or covering on both sides, and thoroughly saturate it with inspissated oil or composition; and when such coating is just beginning to set, but while still capable of being washed off, a coat of plain linseed-oil, thickened with flour, or other suitable body, is to be laid carefully on one surface, without disturbing the first coating of paint or thickened oil; and this latter coating is to be of sufficient thickness to protect it (that is, the composition or inspissated oil first applied) from the action of the air; and when the other or reverse side of the fabric is dry, or the pellicle surface sufficiently formed, then these two coatings of materials on the one, or protected side, may be removed by cleansing the surface with spirits of turpentine, as before stated. Another method of carrying my invention into effect, is by giving the texture or fabric a complete saturation of oil-paint, so compounded as to take a long time to dry, or which will not dry readily, without the addition of metallic oxides: as for example, linseed-oil I use of a tolerable thick consistency, by the addition of pigments, and brush it well into the fabric. I then take the metallic oxide in its dry state, after being ground to an impalpable, or very fine, powder, and sift or distribute a small quantity evenly and equally over one side of the fabric only; by these means, one side will be caused to dry before the other, and thus I am enabled to preserve the other side undried, so as to be washed as before. Another method which may be employed, is to thicken or inspissate the drying oil with lamp-black, or other suitable substance, so as to bring it to a buttery consistence, and then apply it to the fabrics on each side, but with coatings of unequal thickness, which may be done by a brush or other means, in such manner that no more than is intended to form the permanent coating shall be laid on one side, while the other, or temporary, coating is laid on sufficiently thick, that although it skins over, or forms a pellicle on its outer surface, yet

its under or within stratum is not dry, and, therefore, this temporary coating may be readily carried off, which will allow the side of the fabric to be cleaned by means of spirits of turpentine, or other means, as before stated. Another method of obtaining this effect of preventing the one coating from drying, whilst the other is allowed to do so, is by using another description of covering such as a second texture, or a painted or oiled cloth, on other airtight fabric or material, placed in contact with the one surface, in such manner as to keep the siccative composition on the one side moist and loose from the texture, while the other is drying, and the pellicle is being formed and fixed upon it.

I would here remark, that in applying the siccative-oil or composition to the side of the fabric which is to have the permanent pellicle formed upon it, it must not be laid on so thick, that the pellicle, when formed, shall be loose from the surface, which will be the case when too much of the material is spread on it; care should be taken to prevent this effect, for the permanent pellicle should, as it is forming and drying or hardening, take hold of, or incorporate itself with the fibres of the fabric, so that it may firmly adhere thereto.

Having thus described my invention, and several different modes, modifications, or methods, of carrying my improvements into effect, I wish it to be understood, that what I claim is the application of my drying oils, siccative compositions, or varnishes, which have drying or hardening property for the purpose of saturating the texture, in the first place, and then, by artificial means, to cover one side of the texture, so that this side shall remain undried, while the other dries, hardens, or, in other words, has a pellicle formed on that surface, which is exposed to the direct action of the air, or artificial heat, and which pellicle is firmly incorporated with, or attached to, that surface, the other side being protected from the action of the air or heat, which enables the moist part, or

coating, to be cleared away, so as to leave the texture in its original appearance in its surface unimpaired, or nearly so.

Having thus fully stated the nature of my improved manner or method of waterproofing fabrics, and various modifications or processes for effecting the same, I will proceed to explain and describe my improved method of producing damask patterns or designs on silks, and other textures or fabrics, by means of the above described method of drying or coating and waterproofing one surface, while the other is wholly or partially protected from so doing (that is to say) :—First, instead of having a plain table or surface of slate or of wood, placed in contact with that side of the fabric, part of which is only partially to be protected from the drying action of the air or heat, I lay or spread the saturated silk or fabric upon a surface, or table, or block, which has a pattern formed upon it, such pattern being sufficiently countersunk or raised (say about the depth of one-fourth of an inch or more) after the manner of ordinary calico or paper stainer's pattern-block. The raised parts of the pattern-block or table being placed in close contact with one side of the saturated silk or fabric,—that is, the one intended to have the pattern formed upon it, and the fabric stretched over it, the indented or sunken parts, recesses, or interstices of the pattern being filled with the composition, will allow the waterproofing material to harden, or become pellicled, on both sides, in some parts, while the raised parts will prevent such effect taking place, where in contact with the fabrics. After the texture has been spread, or stretched, over the pattern-block, if required, I again cover the outer surface with paints or oils, or other compositions. The saturated fabric should be carefully laid or rolled closely and evenly upon the raised parts of the table or pattern-block, care being taken that every part of the upper surface of the raised parts shall be in close contact with the silk or other texture ; the drying or harden-

ing process may then go on until the pellicle is formed, as before described ; and when the required parts of the surfaces are dried or hardened, I remove the loose or undried parts from the under side, or such parts as have been in contact with the upper surface of the pattern, by means of spirits of turpentine or other agents, as before described. It will be seen that, according to the colour of the paint or waterproofing material used, and the original colour of the silk or fabric, so will a variety of contrasts and pattern, either coloured or plain, be produced. It being easy, by means of the colours of the fabric, and the colours of the waterproofing material, used either on the one or the other side of the fabric, to produce a great variety of ornamental patterns or devices. Another modification of producing the same effect by using perforated pattern-plates, card-boards, hardened oil-cloth, or other suitable laminated material, and placing the same against one side only of the fabric, or between two surfaces of silk, or other texture, stretched on the frame, as before mentioned.

Having now described my improvements in waterproofing fabrics, I wish it to be understood, that I do not confine myself to any particular substance or material for "backing," "covering," or preventing the drying of one side of a saturated texture, either wholly or partially ; neither do I intend to confine myself to any particular siccative composition to be used for saturating and waterproofing the texture or fabric, although I have hitherto found drying oils, and oil compositions, to answer best for the improved manner or method of waterproofing. And I therefore claim, as new and useful, and secured to me by the above in part recited letters patent, the improved modes, methods, processes, or modifications, above described, of applying substances to such saturated texture, so as to prevent one surface thereof from drying, hardening, or forming a pellicle thereon, while the other is allowed so to do by the action of the atmosphere, or artificial heat, to which it is exposed, evaporating a portion of the

aqueous or volatile parts of the oils or compositions, and then afterwards clearing away the moist parts by the agency of spirits of turpentine, or other suitable liquid. And also, I claim the mode, manner, or process, of producing damask patterns or designs on to the surface of such fabrics in the way or manner above stated.—In witness whereof, &c.

GEORGE JOHN NEWBURY.

Enrolled November 12, 1840.

LAW REPORTS OF PATENT CASES.

In the Rolls Court,

Before Lord LANGDALE.

WILSON AND OTHERS *v.* TINDALE.

Mr. Pemberton.—My lord, this is an application on behalf of the plaintiffs, who are assignees of a patent granted to James Soames, on the 9th September, 1829, for “a new preparation or manufacture of a certain material produced from a vegetable substance, and the application thereof, to the purposes of affording light and other uses,” for an injunction to restrain the defendant from making, using, or vending, substances called stearine and elaine, or either of them, produced from cocoa-nut oil, by means described in the specification of the said James Soames; or any candles manufactured from, or compounded of, the said substance, called stearine. My lord, the plaintiffs, upon the faith of having enjoyed undisturbed possession of the patent since 1829, have invested capital to no less an amount than 35,000*l.* in establishing a manufacture in the island of Ceylon, besides capital they have embarked in works in this country. My lord, the effect of this invention has been an increased importation of cocoa-nut, and cocoa-nut oil, almost unprecedented in the history of commerce. The plaintiff’s

right is now, for the first time, interfered with by the defendant, who was discovered, in October last, establishing a manufactory in the neighbourhood of London, and who disputes our right to a patent, as I understand, first, upon the ground, that the invention is not properly the subject of a patent; and, in the next place, supposing the invention to be the subject of a patent, that the plaintiffs do not adhere to the mode of manufacture described in the specification. My lord, the ground upon which the defendant says this is not properly the subject of a patent, I understand to be this:—He says, your invention consists in producing, from cocoa-nut oil by pressure, a substance called stearine, the solid part of the oil, from which candles are made: he alleges, that it has been discovered as a principle of chemistry, that there were many animal fats, and some vegetable oils, from which, by pressure at a certain temperature, a solid matter, called stearine, could be obtained; therefore, you are not at liberty to secure a patent to make candles, by the application of a principle previously known to a substance to which the principle had never been applied. My lord, I admit that a patent cannot be sustained for the discovery of a chemical principle; but the application of that chemical principle to a substance to which that chemical principle has not been applied; and the production by that application, of an article of commerce never previously known, is not only properly the subject of a patent, but the most useful, probably, of all purposes for which patents can be obtained. It is, therefore, nothing to tell me, that the general principle of extracting solid matter from animal, or from vegetable, oil had been previously known. Shew me that cocoa-nut candles ever was made—shew me that from cocoa-nut oil stearine was produced, and applied to the useful purpose of making candles;—if you cannot do this, you cannot disturb the validity of our patent. My lord, my answer to the other objection is this,—that although in the case of this invention, as I

presume in all inventions that ever were recorded in the history of the world, when it came into use, it was found that improvements might be made in the details in particular parts of the manufacture, yet that what we have done has been simply to use more convenient modes: for example,—the pressure is applied by means of involving the oil in thick wrappers, and then, by pressure, squeezing out the liquid portion, and so leaving included in the bags the solid matter, called stearine. Now, instead of using cloth or wrappers, we have found it more useful to use what is called coir-cloth, which is made of the fibre of the cocoa-nut itself,—a thicker, a more solid, and, therefore, a less fragile material. My lord, it appears, that at the time the patent was granted, the cocoa-nut, which is grown principally in the island of Ceylon, was subject to a duty amounting to 30 per cent. The cocoa-nut itself, in its crude state, of course, is imported for the purposes of commerce, as a thing to be eaten, but not for the purposes of being manufactured into cocoa-nut oil: the manufacture of cocoa-nut oil was produced from what is called copperah, (copperah being the cocoa-nut broken in the island of Ceylon), the kernel taken out, broken, and then the broken kernel dried, and by crushing of the copperah, the cocoa-nut oil was produced. There was a heavy duty upon copperah, but none upon cocoa-nut oil; and the duty was not upon importation here, but upon exportation from the island of Ceylon. They said you shall not export copperah,—if you do, you shall pay a duty of 30 per cent.; in other words, we will secure the manufacture of cocoa-nut oil to the island of Ceylon. Cocoa-nut oil was always, I believe, more or less the subject of use in the arts; but it was not till it was discovered that cocoa-nut oil could be used for the purposes I am about to state to your lordship, that it came into extensive use. Now, in 1829, Mr. Soames discovered that this cocoa-nut oil, by being subjected to a particular course of manufacture, might produce a sub-

stance from which candles could be manufactured of a much better quality than tallow candles. He found, that by applying the principle of pressure to cocoa-nut oil at a particular temperature, the solid and liquid matters could be separated; the oily solid matter being called stearine, the liquid matter being called elaine, and that both these substances being separated, would be of infinitely more value than either were in the conjoined state. Having ascertained, by experience, that the manufacture would be attended with success, he obtained a patent for the discovery—(the learned counsel then read the whole of the specification, for which see *Repertory*, vol. X., New Series). There is no dispute about the accuracy of this description, nor is it in dispute that this stearine was an entirely novel product from cocoa-nut oil. My lord, the plaintiffs carried on the manufacture to a very great extent, and I hope with great profit, till a short time ago, when an alteration was made in the duties of the island of Ceylon, and, instead of subjecting the exportation of copperah to a duty of 30 per cent., that duty was reduced to $2\frac{1}{2}$ per cent., whereupon the defendant determined to avail himself of the alteration in the duties, and to establish a manufactory for the purpose of making cocoa-nut oil from copperah; and, in October last, the plaintiff was informed that Mr. Tindall intended to introduce an alteration into his business, not merely to manufacture cocoa-nut oil from copperah, but to manufacture candles from cocoa-nut oil: on receiving this information, the plaintiff wrote to Mr. Tindall, stating what he had heard, and requesting to know if such were the fact, and, in reply, received the following letter from the defendant:—"I beg to acknowledge the receipt of your letter of this day, and to inform you, that the process which I am using in pressing cocoa-nut oil, and manufacturing cocoa-nut candles, is not the same as that described in the specification of Mr. Soames's patent, but is founded upon a principle pointed out in a scientific work, published many years

prior to the date of that patent. I am, &c., (signed W. Tindall.*") There is no doubt, therefore, upon this letter, that the defendant is pressing cocoa-nut oil, and is manufacturing cocoa-nut candles from the cocoa-nut oil subjected to pressure; and I have no hesitation in stating to your lordship, as a principle which cannot be successfully questioned in this case, that if he is making cocoa-nut candles from cocoa-nut oil subjected to pressure, he has violated our patent, even if there is any material difference in the mode by which that pressure was applied, and the articles produced, because our patent is for this:—
“For the production, by means of pressure from a substance, to which that pressure has never been before applied, a product most useful in the manufacture of candles; and it is for that product that we have obtained our patent—(The learned counsel, after reading the affidavits of Messrs. Hawes, Palmer, Barton, Carter, Harrison, Batty, Sandwich, and Maudsley, confirming all the statements of his address, and proving the novelty and great utility of the invention, proceeded as follows):—
The nature of Mr. Tindall's defence I have already mentioned to your lordship. As to the facts, there is very little controversy between us. There is the affidavit of Mr. Tindall, and of Watts, the workman, and of John Powersey, and a gentleman of the name of Sturge. Now Mr. Tindall's evidence raises those points which I have already mentioned to your lordship, and I think no others. He says, “that he has been for some time past engaged in importing cocoa-nuts in a raw state, called copperah, from the Island of Ceylon; and that he has also for some time past been, and still is, engaged in the preparation or manufacture thereof into a hard or solid material, adapted for the manufacture of candles, and into a fluid material, or oil, adapted for burning in lamps, or being used for machinery, or other purposes.” In other words, that he is doing precisely that, which we have

* Mis spelt Tindale in p. 240.

obtained an exclusive right of doing. He says, "that it was well known to chemists and scientific men in general, at a period long prior to the date of the patent, that most, if not all, substances of a fatty nature, as well vegetable as animal, consisted of two distinct materials or parts:—viz., a solid or hard material of the nature of suet, and a fluid material or oil." I take the liberty of requesting your lordship's attention to this statement; he does not pretend to allege even as his belief, that it was known as a general principle that all oil, animal and vegetable, might be thus dealt with. There is a great difference between "most" and "all," and your lordship will find when you come to the details, that it is not all but only very few, with which that principle had been declared to exist. He says, "that the art of separating the hard or solid material of such substances from the fluid material or oil thereof, by means of pressure in hydraulic and other presses, was also well known and in use long prior to the date of the letters patent, and effected in a manner perfectly similar to that described in the specification;" and as an instance thereof, he says, "that the oil of the sperm-whale in its crude state, as imported in this country, has for a period of thirty years and upwards, been, by means of pressure in hydraulic and other presses, separated into a hard or solid substance, and the oil commonly known as sperm-oil used for burning in lamps and for other purposes." He says as a further instance, "A patent was taken out in 1826, by a Mr. Manicler*, a Chemist, for a mode of separating and applying to the purposes of affording light, the hard or solid material existing in common tallow, from the fluid material, or oil therein, which mode was in principle, similar to the mode described in the specification, that is to say: the tallow or fat was placed in cloths, and subjected at first to pressure under heavy weights, and afterwards in an hydraulic press, till the oil or fluid-matter was extracted. That in

* See *Repertory*, vol. III. present series, p. 380.

the year 1815, in the *Repertory of Arts*,* there was published a memoir on the nature of fatty substances by Monsieur Henri Bracounot, in which experiments upon a variety of fatty substances, and the separation of each into a hard or solid material of the nature of suet, and into a fluid material or oil by means of compression in presses, was fully and clearly described. He says, he believes that the principle of the method, by which such substances are therein stated to have been separated, is precisely the same as the principle of the method described in the specification of the plaintiff's patent." Now, your lordship will observe, that every one of the oils mentioned by M. Bracounot, are animal substances, except the three last, every one of which I believe from their expensive nature, are such that they never could be turned to any useful purpose for the manufacture of candles. The first is olive-oil; the second, oil of sweet-almonds; and the third, the oil of colsa, which I believe is rape-seed. My lord, it is not pretended either that Monsieur Bracounot alleges it as a general principle of chemistry, that fatty substances can be divided into liquid and solid matter; and still less is it suggested that cocoa-nut-oil is mentioned as one of the articles that have been subjected to this experiment. Then, he says, "that about the year 1814, the British Government commenced manufacturing in the Island of Ceylon, by means of hydraulic pressure, an oil or fat substance from the nut of the cocoa-nut found there, which they imported into this country by the name of cocoa-nut-oil; and that his ships were employed by the government in conveying such oil to this country, and that such oil after it arrived was generally in a congealed state, of about the consistence and appearance of hogs'-lard, and its chief use was for mixing with tallow for the manufacture of candles. He believes that there was no novelty or invention in the process described in the specification of Mr. Soames's patent, and that such alleged

* See *Repertory*, vol. XXVIII. second series.

invention consisted solely in subjecting to a well known and common process, namely, pressure in cloths by means of an hydraulic press, a material which might not, perhaps, have been so subjected before, but which from its nature it was obvious might have been so subjected, with the same results as those described in the specification." He admits, therefore, in point of fact, that until the application of this mode of manipulation to cocoa-nut-oil was discovered, no experiment even ever had been made before on cocoa-nut, by which it was found to be divisible into two substances of a solid and liquid nature; still less, that the divisions of cocoa-nut-oil into these two substances would produce on the one hand a liquid oil, and on the other hand a solid matter most useful to be applied for the purpose of the manufacture of candles. We do not deny that the principle of the separation of oils, spermaceti-oil for instance, into two distinct substances by means of pressure, and by the same means of pressure which we are using, was known before. That is not the subject of our patent, our patent is for producing by means of pressure applied to cocoa-nut-oil two distinct substances, cocoa-nut stearine and cocoa-nut elaine, neither of which ever have been produced before, and for the use of those two substances for most important purposes of commerce. And, although we have described in the specification, the mode which we adopted for the production of those substances for which our patent was obtained, it is not for the mode of application of pressure to the article, but it is for the application of pressure to that article, and the production by means of that pressure of those substances never before brought into existence, and of course, therefore, never before used for the purposes of commerce. My lord, I never remember an instance in which the evidence was so strong, and so little the subject of controversy as in this case. It is proved that we have been in the actual undisturbed possession of this patent for a period of between eleven and twelve years; and that upon the

faith of this enjoyment, we have made the enormous expenditure which I have mentioned, and under these circumstances, unless your lordship sees much greater doubt than, at present, I am able to imagine in this case, I apprehend that, upon the principles of law acted upon in this court, your lordship will grant this injunction absolutely and positively, without imposing terms of any sort or kind upon the plaintiffs.

Mr. Rotch and Mr. Hubback, followed on the same side.

(To be concluded in our next.)

SCIENTIFIC MISCELLANEA.

Progress of Foreign Science.

THE exhibition of the arts and manufactures of Alsace, formed part of the fetes held in celebration, last year, of the opening of the Railway from Strasbourg to Bâle. The details of the exhibition, although given in the French Journals with great parade, seem to have little to strike the English manufacturer with fear.

The largest planing machine exhibited could operate on a solid for 11 metres long, 3 metres wide, and 2 metres high, made by M. M. Stehelin and Huber.

Much praise is given to a heavy lathe, said to be capable of taking off shavings of wrought-iron of 55 millimetres wide by 4 millimetres thick. This is about two inches wide by about one-eighth of an inch thick,—strictly, 0·157 of an inch.

Locomotives for the Strasbourg Line, stationary high-pressure engines, parts of large marine engines, said to be “Destiné a la navigation transatlantique,” are also amongst the machines.

Copper rollers for calico-printing have begun to be manufactured on the Continent; and fire-engines, like those of our London establishment. The exhibition of ornamental tissues, the legitimate field of Alsacian industry, seems to have been very large and brilliant. They have commenced the manufacture also of waterproof cloths, in imitation of our Mackintosh fabrics.

Paper, typography, chemical productions, damasks, marquetry, painted porcelain, optical and mathematical instruments, and other classes of productions, attest the large advances which twenty-five years of peace have enabled the manufacturers of the Continent to make in rivalling, and, in some few things, excelling us: if, there-

fore, a limit could be set to improvement in manufactures; if a point could be foreseen, beyond which human wants and invention could not go, there would be room for despair on our parts as a nation eminently manufacturing; but such is not the case: and that same creative energy, which has placed us so far in these respects in advance of other nations, will be merely roused to higher and greater efforts by their advances, and thus shall we, under Providence, preserve that predominance which we have held as a manufacturing nation for centuries.

A beautiful mode of ornamenting marbles has recently been brought into use in Paris:—It consists in etching, by acids, deeply into the marble, various designs upon a properly prepared bituminous ground. When the corrosion has gone sufficiently deep, the cavities are filled up with hard coloured wax, prepared so as to take a polish equal to that of the marble when cleared off. Drawings thus made on black marble, and filled in with scarlet wax, after the manner of Etruscan, and certain Egyptian designs, are said to have a very noble effect, and are applied to tables, panneling, stoves, &c., &c.

The king of Sardinia has published an edict by which the Royal monopoly in saltpetre is abolished, and all persons are at liberty to collect, manufacture, or sell it.

Thin polished plates of white marble are now strongly recommended by several French artists, as a substitute for ivory in miniature painting.

The slices of marble are cemented down upon a sheet of board paper, to prevent danger of fracture: they are said to take the colour with great freedom, and to hold it with tenacity; and it is obvious, that they are incapable of any change by time, or the effects of heat or damp. Ivory, it is well known, becomes yellow; and in hot climates often splits or warps. It can only be obtained also of a very limited size; whereas, these plates of the finest grained statuary marble can be obtained of any size.

Plates of about 12 inches by 10 inches are prepared of only about three-sixteenths of an inch thick, and smaller ones thinner in proportion. Marble has been occasionally used before now as a plane for painting on *in oils*; but its application to miniature painting is certainly new, and seems valuable.

On the Light which is apparent during Crystallization.

M. H. ROSE has published an extremely interesting paper upon this subject in the *Comptes Rendu de l'Academie de Berlin*. A long time ago he discovered, and gave account of the fact, that when arsenious acid, in its vitreous state, was dissolved in hydrochloric acid hot, light was evolved, as each crystal formed on the cooling of the solution: and from the whole of his experiments at that time, (*Annales de Chim. et Phys.*, lxi. p. 288), he concluded, that the production of light depended on the passage of the arsenious acid from the vitreous to the opaque condition.

The observations that have been from time to time made on the light of crystallization, have been of a desultory and incomplete character, owing to the circumstance that the phenomenon was an accidental one, and could not be re-produced at will. Thus it has been remarked by various authors, that sulphate of potass evolved light in crystallizing. Rose made many fruitless attempts to re-produce the

phenomenon, but could not succeed with *pure* sulphate of potass, either crystallizing from solution or from fusion. He found, however, that in fusing together equal atomic weights of sulphate of potass and sulphate of soda, he obtained a mass not *crystalline*, like the former, but *vitreous*; and on dissolving this in boiling water, filtering rapidly, and placing it in the dark to crystallize, brilliant scintillations were produced, like those in the case of arsenious acid. When these crystals were re-dissolved, and again crystallized, no fresh scintillations resulted. The crystals obtained *with* light are phosphorescent on pressure, and one of the ordinary forms of sulphate of potass. The fused vitreous mass of double salt must be dissolved within a few hours of its fusion; otherwise internal crystallization takes place, and the light is not evolved on solution, &c. The crystals, which form a solution, although in the shape of sulphate of potass, are a double sulphate of potass and soda. The memoir contains, after giving their constitution, some very interesting observations on the parts which the soda-salt plays during their joint crystallization. M. Rose has also ascertained strictly analogous facts, with regard to double salts, composed of sulphate and chromate of potass and soda, of chromate of potass and soda, and of tellurate of potass and soda, all of which are isomorphous: he finds the presence of the soda-salt essential to the phenomena. Finally, he concludes that the luminous appearances occurring during the crystallization of salts, are due to their passage from one isomeric state to another, a conclusion which these experiments, so far as they go, undoubtedly sustain; and hence, the first resemblance of a law connecting this curious class of phenomena, is due to M. Rose. There are, however, some other observed cases of light given out during crystallization, which, although they may, on future examination, be found reducible to this law, are not so at present. Thus, M. Scanlan observed brilliant and continued flashes of light during the crystallization of nitrate of strontian, a fact not before observed (nor published) previous to the present notice.

Composition of the Atmosphere.

The last year has been marked by several rich contributions to our knowledge, upon this important and difficult subject. Dumas and Boussingault, in conjunction with M. Brunner, have analyzed the atmosphere of various localities by new and rigidly exact methods. Their researches are too lengthened and important to admit of expression by a mere extract, but their conclusions may just be stated, and appear worthy of complete reliance.

Their researches correct the errors committed, as to the density of oxygen compared with that of azote, and fix the density at $=1.1057$, and that of azote at $=0.972$. They shew that air cannot be regarded as a chemical compound of 20 volumes of oxygen and 80 volumes of azote; but they indicate that the atmosphere is a mixture uniformly composed at every epoch, at every latitude, and at all heights, of 2301, by weight of oxygen, and 7699, by weight, of azote; or by volume of 20.81, oxygen, and 79.19, azote. They demonstrate that if it be true that plants are destined, by the action of their green parts in the sun's light, to destroy the carbonic-acid given off by animals, yet that their intervention is not necessary, since under the most unfavourable suppositions, not less than 800,000 years would have elapsed, before the whole mass of the atmosphere could be deprived of oxygen, by all the animals living upon its surface; from which it follows, that the atmosphere, considered as

a reservoir of oxygen for animals, and of carbonic-acid for plants, is a magazine so vast, that the expenditure of both, although in no way compensated, would be still inappreciable after the lapse of ages.

From hence, also, it follows, to have the least chance of rendering any variation in the mean proportions of oxygen and azote appreciable, would require analyses to be made with apparatus capable of operating upon about a kilograme and a half of air = 3.307 lbs. avoirdupoise. The methods of investigation, some of which are entirely due to M. Brunner, and were published by him some years since in *Poggendorff's Annalen*, are extremely beautiful.

Amongst our own countrymen we have recently had examinations of air from the Cornish mines by M. Moyle, and of that from the pestilential regions of the tropics by Professor Daniell. The latter gentleman has been the first in this country to place in a palpable view the influence of sulphuretted hydrogen in producing disease. But, M. Savi, of Pisa, an Italian savant, it appears, read to the meeting of the scientific Congress, held at Pisa, in October, 1839, a paper on the causes of malaria in certain parts of Italy, in which he then proposed the evolution of this gas as the principal cause. It is now generally admitted, that the evolution of sulphuretted hydrogen in marshes, or at the mouths of tropical rivers, is due to the re-action of organic matter in certain stages of decay upon sulphates of earthy or metallic bases existing in the water, whether fresh or salt, but most usually the latter. In the valuable memoir of Prof. Daniell, published in the *Philosophical Magazine*, a claim is generally made by the author to the first origination of this theory of the formation of this gas; but he appears to have been independently anticipated by M. Savi, and, indeed, the same solution of the problem appears to have been given by several others, also previously. M. Mallet has shewn his own views as to the source of the gas to have been the same, as published in the *Reports of the British Association* (1840); and similar conclusions were previously given by Berthier, and by Leibig. It is remarkable thus to find so many experiments arriving independently at the same results.

Analysis of Guano, by M. Voelckel.

This substance, which forms vast beds on various lands on the coast of South America, has lately become an article of British commerce as a manure, of which it is one of the richest known. Its origin is somewhat uncertain, but it is with great probability supposed to be the dung or rather urine of sea fowl, deposited for ages on these rocky isles. This now is sustained by the analysis of M. Voelckel, since he has shewn it to contain, not only uric-acid, but two substances into which it is readily transformed, viz., ammonia and oxalic-acid.

100 parts of moist guano, gave

Urate ammonia	9.
Oxalate ammonia	10.6
Oxalate lime	7.
Phosphate ammonia	6.
Ammoniacal phosphate of magnesia	2.6
Sulphate of potass	5.5
Sulphate of soda	3.8
Hydrochlorate ammonia	4.2
Phosphate lime	14.3
Clay and sand	4.7

Organic substances undetermined, of which one seventh is soluble in water, and water.....	32·3
A soluble salt of iron.....	a trace

100·0

If these results be compared with those of Fourcroy and Vanuelin, and of Wollaston, on the urine of birds, the connexion will be obvious. Wollaston found that the amount of uric-acid in the urine of birds augmented in proportion as their food was more azotical, thus a chicken, only contained two-hundredths of uric-acid, while that of a gannet, living wholly on animal food, was found to consist of nothing but uric-acid. The extreme value of this substance as a manure, will probably be much undervalued for a long time by our agriculturists, if not entirely neglected;—for in Britain, with all the labour we bestow upon our own marvellous agriculture, we neglect and suffer to be wasted the richest and most valuable manures, and which are produced and suffered to run away in the sewerage of our great cities. Thus Leibig has shewn that a pound of human urine, (i. e. evaporated to dryness, or what is the same thing, the salts which it contains) will produce its own weight of wheat.

R. M.

NOTICE OF EXPIRED PATENTS.

CHARLES HARSLEBEN, of New Ormond Street, in the county of Middlesex, Esquire, for improvements in machinery to be used in navigation, chiefly applicable to the propelling of ships, and other floating bodies, and which improvements are also applicable to other purposes.—Sealed April 3, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 86.*)

LEMUEL WELLMAN WRIGHT, of Webber Street, Lambeth, in the county of Surrey, Engineer, for an improvement or improvements in the construction of wheel-carriages, and in the machinery employed for propelling, drawing, or moving wheel-carriages.—Sealed April 15, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 216.*)

JOHN GOTTLIEB ULRICH, of Cornhill, in the city of London, Chronometer Maker, for improvements in chronometers.—Sealed April 19, 1828.

WILLIAM MARSHALL, of Fountain-Grove, in the parish of Huddersfield, in the county of York, Shear Manufacturer, for improvements in machinery for cutting or shearing, cropping and finishing cloth and other articles, manufactured from wool or other raw materials.—Sealed April 26, 1828.—(*For copy of specification, see Repertory, Vol. 8, third series, p. 65.*)

THOMAS BREIDENBACH, of Birmingham, in the county of Warwick, Merchant, for a machine, or improved mode by use of machinery, for forming or manufacturing tubes or rods, and for other purposes.—Sealed April 26, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 83.*)

JAMES GRIFFIN, of Withy Moor Works, near Dudley, in the county of Worcester, Scythe Manufacturer, for an improvement in the manufacturing of scythe-backs, chaff-knife backs, and hay knife backs.—Sealed April 26, 1828.—(*For copy of specification, see Repertory, Vol. 9, third series, p. 11.*)

JOHN JAMES WATT, of Stracey Street, Stepney, in the county of Middlesex, Surgeon, for the application of a certain chemical agent to destroy animal poison, and the disease consequent thereon.—Sealed April 29, 1828.

CHARLES CARPENTER BOMPAS, of the Inner Temple, Esquire, for improvements in the propelling of locomotive carriages and machines, and boats and other vessels.—Sealed April 29, 1828.

LIST OF NEW PATENTS.

WILLIAM NEWTON, of Chancery Lane, Civil Engineer, for certain improvements in regulating the flow of air and gaseous fluids. Communicated by a foreigner residing abroad.—Sealed February 25, 1842.—(*Six months.*)

OSBORNE REYNOLDS, of Belfast, Ireland, Clerk, for certain improvements in covering streets, roads, and other ways with wood, and also in the means of enabling horses and other animals to pass over such roads and other slippery surfaces with greater safety than heretofore.—Sealed February 25, 1842.—(*Six months.*)

JOHN BIRKBY, of Upper Rawfold, York, Card Manufacturer, for improvements in the manufacture of wire-cards.—Sealed January 25, 1842.—(*Six months.*)

WILLIAM SAUNDERS, of Brighton, Gentleman, for improvements in apparatus employed in roasting and baking animal food.—Sealed February 25, 1842.—(*Six months.*)

SAMUEL MORAND, of Manchester, Merchant, for improvements in machinery or apparatus for stretching fabrics.—Sealed February 26, 1842.—(*Six months.*)

MARC LA RIVIERE, of London Fields, Hackney, Gentleman, for certain improvements in the machinery for figure weaving in silk and other fabrics.—Sealed March 1, 1842.—(*Six months.*)

THOMAS SMITH, of Northampton, Plumber, for an improvement or improvements in water-closets.—Sealed March 1, 1842.—(*Six months.*)

GEORGE CARTER HASELER, of Birmingham, Jeweller and Toy Maker, for improvements in tops of scent-bottles.—Sealed March 3, 1842.—(*Six months.*)

EDWARD SLAUGHTER, of Bristol, Engineer, for improvements in the construction of iron wheels for railway and other carriages.—Sealed March 4, 1842.—(*Six months.*)

JAMES CLEMENTS, of Liverpool, Manufacturer of Toys, for improvements in composition for ornamenting glass and picture-frames, and articles for interior and other decorations, also for the manufacture of toys and other fancy articles.—Sealed March 4, 1842.—(*Six months.*)

WILLIAM PALMER, of Sutton Street, Clerkenwell, Manufacturer, for improvements in the construction of candle-lamps.—Sealed March 4, 1842.—(*Six months.*)

WILLIAM PALMER, of Sutton Street Clerkenwell, Manufacturer, for improvements in vessels for making infusions or decoctions, and for culinary purposes, and in apparatus for measuring or supplying from vessels.—Sealed March 4, 1842.—(*Six months.*)

JOHN GREEN, Junior, of Newtown, Worcester, Farmer, for certain improvements in apparatus or machinery for cutting or reducing turnips, mangel wurzel, carrots, and other roots, for food for horned cattle, horses, and other animals.—Sealed March 7, 1842.—(*Six months.*)

JOHN GEORGE BODMER, of Manchester, Engineer, for certain improvements in machinery or apparatus for cleaning, carding, roving, and spinning, cotton and other fibrous substances.—Sealed March 7, 1842.—(*Six months.*)

JAMES READMAN, of Islington, Gentleman, for a certain improvement or improvements in the barometer.—Sealed March 7, 1842.—(*Six months.*)

JOHN DUNCAN, of Great George Street, Westminster, Gentleman, for improvements in machinery, for excavating soil. Communicated by a foreigner residing abroad.—Sealed March 7, 1842.—(*Six months.*)

JOHN WARWICK, of Lawrence Pountney Lane, London, Merchant, for an apparatus called a gasoscope, and intended to shew the presence of bi-carburetted hydrogen gas (the gas used for lighting), in mines, wells, houses, buildings, rooms, or vaults, and, consequently, to prevent the explosions and accidents liable to be produced by the said gas. Communicated by a foreigner residing abroad.—Sealed March 7, 1842.—(*Two months.*)

FRANCIS CANE, of Cumberland Street, Middlesex Hospital, Mechanic, for improvements in the construction of fastenings for the parts of bedsteads and other frames.—Sealed March 7, 1842.—(*Six months.*)

SIR FRANCIS DESSANGES, of Upper Seymour Street, Portman Square, Knight, and **ANGUISH HONOUR AUGUSTUS DURANT**, of Long Castle, Shropshire, Esquire, for improvements in apparatus for sweeping and cleansing chimnies or flues, and extinguishing fires therein, which they intend to call "Ramoneur."—Sealed March 7, 1842.—(*Six months.*)

ROBERT FRAMPTON, of Cleveland Street, Fitzroy Square, Coach Maker, for improvements in the construction of hinges.—Sealed March 7, 1842.—(*Six months.*)

HENRY BARRON RODWAY, of Birmingham, Warwick, Wine Merchant, for improvements in the manufacture of horse-shoes.—Sealed March 7, 1842.—(*Six months.*)

THOMAS HENRY RUSSELL, of Wednesbury, Stafford, Iron Tube Manufacturer, and CORNELIUS WHITEHOUSE, of the same place, for improvements in the manufacture of welded iron tubing.—Sealed March 7, 1842.—(*Six months.*)

WILLIAM NEWTON, of Chancery Lane, Civil Engineer, for an improved machine or apparatus for weighing various kinds of articles or goods. Communicated by a foreigner residing abroad.—Sealed March 7, 1842.—(*Six months.*)

THOMAS HEDLEY, of Newcastle-upon-Tyne, Gentlemen, and CUTHBERT RODHAM, of Gateshead, Durham, Millwright, for an improved apparatus for purifying the smoke, gases, and other noxious vapours, arising from certain fires, stoves, and furnaces.—Sealed March 7, 1842.—(*Six months.*)

WILLIAM CUTFORD, of Chard, in the county of Somerset, Mechanic, for certain improvements in machinery or apparatus for making or manufacturing lace or other netted fabrics.—Sealed March 8, 1842.—(*Six months.*)

HENRY SMITH, of Liverpool, Engineer, for improvements in the construction of wheels and breaks for carriages.—Sealed March 10, 1842.—(*Six months.*)

RICHARD BEARD, of Earl Street, Blackfriars, Gentleman, for improvements in the means of obtaining likenesses and representations of nature, and of other objects.—Sealed March 10, 1842.—(*Six months.*)

WILLIAM EDWARD NEWTON, of Chancery Lane, Civil Engineer, for certain improvements in boilers, furnaces, and steam-engines. Communicated by a foreigner residing abroad.—Sealed March 10, 1842.—(*Six months.*)

CHARLES WILLIAM FIRCHILD, of Wooley Park, Northfield, Worcester, Farmer, for an improved propelling apparatus for marine and other purposes.—Sealed March 14, 1842.—(*Six months.*)

REUBEN PARTRIDGE, of Cowper Street, Finsbury, Engineer, for certain improvements in machinery or apparatus for splitting and shaping wood and splints for the manufacture of matches, and other similar forms.—Sealed March 14, 1842.—(*Six months.*)

ALFRED GREEN, of Sheffield, Surgical Instrument Maker, for certain improvements in trusses or surgical bandages.—Sealed March 14, 1842.—(*Six months.*)

EDWIN WARD TRENT, of Old Ford, Bow, Rope Maker, for an improved mode of preparing oakum, and other fibrous substances for caulking ships and other vessels.—Sealed March 21, 1842.—(*Six months.*)

SYDNEY JESSOP, of Sheffield, Merchant, for an improved mode of preparing wrought-iron intended for wheel-tires, rails, and certain other articles.—Sealed March 21, 1842.—(*Six months.*)

ZACHARIAH PARKES, of Birmingham, Manufacturer, for certain improvements in apparatus for grinding and dressing wheat, and other grain.—Sealed March 21, 1842.—(*Six months.*)

WILLIAM HANCOCK, the Younger, of Amwell Street, Gentleman, for certain improvements in combs and brushes.—Sealed March 21, 1842.—(*Six months.*)

JOHN CLAY, of Cottingham, York, Gentleman, and FREDERICK ROSENBORG, of Sentcoates, Gentleman, for improvements in arranging and setting up types for printing.—Sealed March 21, 1842.—(*Six months.*)

EDWARD JOHN DENT, of 82, Strand, Chronometer Maker, for certain improvements in chronometers and other time-keepers.—Sealed March 21, 1842.—(*Six months.*)

WILLIAM BROCKEDON, of Queen Square, Gentleman, for improvements in manufacturing fibrous materials for the cores of stoppers to be coated with India rubber, and used for stopping bottles and other vessels.—Sealed March 21, 1842.—(*Six months.*)

JOHN HAUGHTON, of Liverpool, Clerk, for improvements in the method of affixing certain labels.—Sealed March 21, 1842.—(*Six months.*)

WILLIAM PALMER, of Sutton Street, Clerkenwell, Manufacturer, for improvements in the manufacture and preparation of pills, and some other articles of a medicinal or remediate nature.—Sealed March 21, 1842.—(*Six months.*)

MARK FREEMAN, of Sutton Common, Surrey, Gentleman, for improvements in the construction of inkstands.—Sealed March 21, 1842.—(*Six months.*)

ROBERT HAZARD, of Clifton, Somerset, Confectioner, for improvements in apparatus for heating public and private buildings.—Sealed March 21, 1842.—(*Six months.*)

MOSES SPERRY BEACH, of Norfolk Street, Strand, Printer, for improvements in machinery used for printing with type, and in the construction of type for printing. Communicated by a foreigner residing abroad.—Sealed March 23, 1842.—(*Six months.*)

THE
REPERTORY
OF
PATENT INVENTIONS.

No. CI. NEW SERIES.—MAY, 1842.

Specification of the Patent granted to JOHN LEE, of Newcastle-upon-Tyne, Manufacturing Chemist, for Improvements in the Manufacture of Chlorine.—Sealed August 4, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My invention relates to a mode of manufacturing chlorine by the use of retorts or ovens, which are so arranged as to have the heat requisite for the process transmitted downwards through the covering or arch of the oven or retort; and in order that my invention may be most fully understood, and readily carried into effect, I will proceed to describe the process as pursued by me.

Description of the Drawing.

Fig. 1, is a longitudinal section of three retorts or ovens.

Fig. 2, is a plan of the troughs, constituting the lower parts of the ovens or retorts.

Fig. 3, is a transverse section taken from front to back of one of the retorts or ovens; and,

Fig. 4, is part of a front view in elevation of two of the retorts or ovens.

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In each of these figures the same letters indicate similar parts. *a, a, a,* are three stone troughs or vessels in which the chlorine is to be generated; these troughs are made of a stone which will not be materially acted on by the process: the stone used by me is such as is now used in the construction of condensers and flues of alkali works, and is well known; or such trough may be made of fire-clay, moulded to the form and burned: these troughs are supported by brick, enclosed by walls of brick, *b*, and covered by arches, *c*, through which the heat requisite for the process is transmitted, forming separate ovens, chambers, or generators. A door, *e*, for the introduction of materials at one end of the generator is provided, made tight when at work by any of the usual lutings; and at the other end there is a pipe, *f*, of lead or earthenware, for conveying away the chlorine produced, which is to be received and treated as heretofore, when other arrangements of chambers have been used. The heat necessary for the operation is communicated to the materials in the chambers or ovens, *a*, through the medium of the arches, *c, c*, by the heat of the fire passing over them, as is shewn; the flame and heat of the fire being carried over the arches, *c*, along a horizontal flue, *g*. In order to secure the arches, *c, c*, being tight, I cover them with a flux composed of four parts of fire-clay, two parts of ground fire-brick, and one part of common salt, decreasing or increasing the common salt, as the flux is required to bear a greater or less heat. The process is commenced by introducing a quantity of manganese in lumps into the troughs or ovens, *a, a, a*. The doors are then to be closed and luted, a quantity of muriatic acid is gradually introduced through a glass or earthenware-pipe, *h, h, h*, fixed through the walls passing into the troughs. Heat being applied, as above described, chlorine is generated until the muriatic acid becomes nearly saturated, when the door may be removed, and the liquid muriate of manganese drawn off by a syphon; the door is again to be

closed, and a fresh portion of muriatic acid added, and so on until the whole of the manganese is decomposed, when the troughs, *a, a, a*, may be cleansed of the residuum and the process again commenced, as above described.

Having thus described the nature of my invention, and the manner in which the same is to be performed, I would have it understood that I do not confine myself to the precise details of the ovens, retorts, or chambers, *a, a, a*, above described, so long as the peculiar character of the invention of simply heating downwards be retained: and although I prefer to depend simply in the use of heat transmitted downwards through a cover or arch, *c*, as above described; yet as the use of troughs for the bottoms of chambers of ovens, each made of one piece of stone or moulded fire-clay, will admit of fire-heat being applied below and at the sides, I do not confine my invention to the mode of transmitting the heat when such troughs are used; but what I claim is, first, the mode above described, of manufacturing chlorine by the use of retorts or ovens, which are so arranged as to have the heat requisite for the process transmitted downwards through the coverings or arches of the retorts or ovens, as above described; and,

Secondly, I claim the mode of constructing the troughs or bottoms of ovens, or chambers, for evolving chlorine, when fire-heat is used below, or at the sides, or top of each of one piece of stone, or moulded fire-clay, as described.—
In witness whereof, &c.

JOHN LEE.

Enrolled February 4, 1842.

Specification of the Patent granted to JOSEPH GAUCI, of North Crescent, Bedford Square, Artist, and ALEXANDER BAIN, of Wigmore Street, Cavendish Square, Mechanist, both in the County of Middlesex, for Improvements in Ink-stands and Ink-holders.—Sealed June 21, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—Our invention relates, first, to a mode of constructing ink-stands and ink-holders by applying a force-pump below the surface of the ink in the vessel containing the ink, and thus to supply ink from time to time for use ; and,

Secondly, our invention relates to a mode of constructing ink-stands and ink-holders, by causing the ink vessel (or part thereof) containing ink to move partly round, and, by the gravitating property of the ink, to supply ink to an ink-holder for use ; and in order that our invention may be most fully described and readily carried into effect, we will describe the drawings hereunto annexed, and the figures and letters marked thereon.

Description of the Drawings.

Fig. 1, represents the section of an ink-stand and ink-holder, made according to the first part of our invention.

Fig. 2, shews another section of the same ink-stand and holder, the ink being raised into the ink-holder for use, whilst in the previous figure the ink is all within the ink-stand. *a*, is the ink-holder, the tube, *b*, by which it is supplied, being in connexion with a pump-barrel, *c*, within which works the piston, *d*, there being slits or openings, *e*, *e*, by which the ink can flow from the vessel containing the ink into the pump-barrel, *c*. The piston, *d*, is raised and lowered by a screw, or by other convenient means ; and it will be evident, that when the piston is

raised above the slits or openings, *e, e*, as shewn in fig. 1, the ink will flow into the barrel of the pump, and the descent of the piston will force the ink from the pump-barrel into the ink-holder, *a*, for use; and when the ink is no longer required, the piston being raised, will allow the ink to flow back into the ink-vessel or stand.

Figs. 3 and 4, shew two other sections of an ink-stand differing somewhat from that shewn in figs. 1 and 2, for it will be seen, that the piston acts to force the ink into the ink-holder by its ascending movement, in place of acting to press up the ink in its descent in the barrel of the pump. In the figs. 3 and 4, the same parts are marked with the same letters of reference, and the description given to them in respect to figs. 1 and 2, will apply, subject to the above observations.

Figs. 5 and 6, shew two sections of another arrangement of ink-stand and ink-holder acting in a similar manner, in respect to the pumping up of ink by a piston working in a suitable pump-barrel; but in this case the piston is affixed to the tube, *f*, through which the ink is forced into the ink-holder, *a*, and the piston, *d*, enters a well or barrel formed at the lower part of the vessel containing the ink, as is shewn. The tube, *f*, is fixed in a cork or other suitable stopper, *g*, there being an ornamental cover, *h*, for the mouth of the inkstand, as is shewn; and it will readily be understood, on an examination of the drawing, that if the stopper, *g*, be raised, as in fig. 5, the whole of the ink will flow back into the ink-stand; and on the other hand, when the stopper is pressed into the mouth of the ink-vessel, as shewn in fig. 6, the piston will be pressed into the chamber or barrel constituting the pump-barrel, and the ink will be thereby forced up through the tube, *f*, into the ink-holder, *a*, for use.

We will now describe the second part of our invention.

Fig. 7, shews a front view.

Fig. 8, shews an end view; and,

Figs. 9 and 10, shew transverse sections of an ink-

stand and ink-holder, constructed according to the second part of our invention,—figs. 7, 8, 9, shewing the ink supplied to the ink-holder for use, and fig. 10, shewing the ink returned to the ink-stand. The ink-stand consists of a barrel, *h*, which is capable of moving partly round in the frame, *i*, it being retained secure in the frame, *i*, by the part, *i*, which partly embraces the cylinder or barrel, *h*. The ink-holder, *j*, forms part of, or is affixed to, the barrel, *h*, there being an opening, *k*, for the flow of ink into and from the ink-holder, as is shewn. *l*, is the cover of the ink-holder when it is retained stationary, in the position shewn in the drawing, fig. 10, and is carried by the part, *i*, as is also shewn. *m*, is an opening to allow of air passing into the barrel or ink-stand; the application of this hole allows the ink to flow into the ink-holder, when brought into a proper position, and the ink is prevented overflowing in case of increase of temperature, the expanded air passing off at the hole, *m*. In using an ink-stand constructed as above explained, the ink is filled into the ink-holder, when in the position shewn at figs. 7, 8, and 9; and when not required for use, the ink is all caused to flow into the ink-stand by moving the barrel partly round, and into the position shewn at fig. 10, by which means the ink will not only be returned, but the ink-holder will be closed by coming against its cover, and thus prevent dust getting into the ink; and when again required for use, the ink-holder being again moved into the position, shewn in figs. 7, 8, and 9, the ink will flow into the ink-holder; or, in place of the whole ink-vessel moving partly round, in order to bring the ink-holder, *j*, to a proper position to receive the flow of ink, only part of the ink-vessel or apparatus connected therewith may be moved.

Figs. 11 and 12, shew an ink-stand and ink-holder according to this variation of construction. In this case, only the part, *x*, moves round, such part, *x*, carrying the ink-holder; and the general vessel containing the ink, remains

stationary, the part or end, x , being kept close by means of a spring, y . The metal part, x , is lined with glass cemented within it, and the surfaces being ground together in order to make a fluid tight joint; or a fluid tight joint may be made by other convenient means, allowing the part which carries the ink-holder to move, in order to bring the ink-holder to receive ink. The spring, y , carries the cover, l , of the ink-holder, and when it is required to remove the end or cover, x , that may be done by removing the screw, y^1 , when the spring, y , may be moved out of the way by turning on its axis, y^2 , all which will be readily understood on examining figs. 11 and 12 of the drawings.

Having thus described the nature of our invention, and the manner in which the same is to be performed, we would have it understood that we do not confine ourselves to the precise details shewn, so long as the peculiar character of our invention be retained. And we wish it to be understood, that what we claim is, first, the mode of constructing the ink-stands and ink-holders by applying thereto a force-pump below the level of the ink in the ink-stand, as above described in respect to figs. 1, 2, 3, 4, 5, and 6; and,

Secondly, we claim the mode of constructing ink-stands and ink-holders, by causing the vessel, or part of the vessel, containing the ink to move partly round, and, by the gravitating property of the ink, to supply the ink-holder, as described in respect to figs. 7, 8, 9, 10, 11, and 12.—In witness whereof, &c.

JOSEPH GAUCI.

ALEXANDER BAIN.

Enrolled December 21, 1841.

Specification of the Patent granted to THOMAS BIGGS, of Leicester, in the County of Leicester, Merchant, for Improvements in Securing Hats, Caps, and Bonnets from being lost by the effect of Wind or other causes.
—Sealed October 7, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—
My invention relates to the application of elastic strings, bands, or straps, made partly of India-rubber, to hats, caps, and bonnets, whereby I am enabled to fasten hats, caps, or bonnets, to the heads of persons in such manner as to ensure the hats, caps, and bonnets, from being lost in case of wind, and from being blown off when riding; and by such use and application of elastic strings, bands, or straps, made partly of India-rubber, they may, when not required for use (and as they will under such circumstances be in the contracted state) be out of the way within the hats, caps, or bonnets, or in other convenient position. The object of the invention being to obtain the advantages of the elasticity of India-rubber fabrics (made in narrow widths or in cords) for fastening hats, caps, and bonnets; and in order that the invention may be most fully understood and readily carried into effect, I will proceed to describe the drawing hereunto annexed.

Description of the Drawing.

Figs. 1 and 2, represent sections of a hat having an elastic band, string, or strap, applied. *a, a*, being the elastic band, string, or strap; and I may remark, that I prefer that class of elastic bands or tapes, or webs, which are produced by braiding over threads or strands of India-rubber, as they offer a greater extent of elasticity than the other elastic webs or tapes, made partly of India-rubber, but manufactured by other means, though such other elastic fabrics, partly of India-rubber, may be used.

The elastic bands may be applied or fastened to hats, bonnets, and caps, in various ways : I do not, therefore, confine myself to the precise means shewn in the drawings, as many variations may be made, the only care to be observed in fixing elastic bands, strings, or straps, being, that they should be of such length that they will allow of being drawn out to an extent equal to pass under the chin of the person when putting the hat, cap, or bonnet, on to the head, and that without prejudice to extent of elasticity of the rubber. In figs. 1 and 2, there are two small metal holders, *b, b*, affixed within the hat, through which the band or strap, *a*, passes, and the two ends are connected by means of a buckle, *c*, or are sewed or otherwise fastened together, as is shewn in figs. 1 and 2, and more clearly at fig. 3, where the parts are shewn full size.

Fig. 4, shews a bonnet with an elastic band, string, or strap, *a*, applied thereto, the two ends being affixed by sewing within the head of the bonnet, and the string or strap, *a*, is shewn to be stretched, as if under the chin of the person ; but when not so extended, it would contract and lie within the head of the bonnet : this strap is also shewn to have a buckle, but that may be dispensed with, and the band, strap, or string, *a*, be in one piece.

Fig. 5, shews a hat having an elastic string, strap, or band, *a*, the two ends being fastened within the head of the hat, the strap being shewn in the extended state.

Fig. 6, shews a cap having an elastic strap, string, or band, the two ends being fastened within the cap, and the strap is shewn in the extended state ; and it will be understood, that when released it will be within the cap out of the way ; or, in place of having the strap, *a*, within the cap, the ends may be fastened at the two sides of the cap, and be round the front of the cap in a similar manner to the leather strap now used ; and when the elastic strap is required to be brought under the chin, the strap, *a*, will be extended for that purpose.

From the above description, aided by the drawing, it will
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readily be seen, that the mode of fixing bands, straps, or strings, made partly of India-rubber, may be varied, so long as the elasticity is brought into action, for allowing the strings, straps, or bands, to be stretched, in order to pass them under the chin, and by their elasticity to hold on the hats, caps, or bonnets ; and when not required for such use, they will contract and lie out of the way. I wish it, therefore, to be understood, that I do not confine myself to the precise forms shewn ; but what I do claim as the invention is the mode of securing hats, caps, and bonnets, by the application of elastic bands, straps, or strings, made partly of India-rubber, as above described.

THOMAS BIGGS.

Enrolled December 28, 1841.

Specification of the Patent granted to WILLIAM CROSS-KILL, of Beverley, in the County of York, Iron Founder, for Improvements in Machinery for Rolling and Crushing Land, and in Machinery to be Used in the Culture of Grass-Lands.—Sealed September 8, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention relates first, to improvements on machinery used in crushing and rolling land ; and,

Secondly, to improvements in machinery to be used in the cultivation of grass-lands ; and in order that my invention may be most fully understood and readily carried into effect, I will proceed to describe the drawing hereunto annexed, and the figures and letters marked thereon.

Description of the Drawing.

Fig. 1, represents a machine for rolling and crushing land, constructed according to my improvements.

Fig. 2, is a plan thereof. *a, a*, is a strong framing; and *b, b*, the shafts for a horse affixed thereto. *c*, is an axis on which is placed a series of rolling surfaces, *d, d*, the outer circumference of each of which has teeth, *e, e, e*, and also other teeth, *f*, the teeth, *f*, being at right angles to the face of the rolling surface, *d*; and it will be observed, that a line which would pass through the centre of any one of the cross-teeth, *f*, would not be a radial line, as is indicated by the blue line, *g* to *h*; the red line, *i, i*, shewing the radial line proceeding from the centre to the outer circumference; hence these teeth, when they come down on the land, will be more vertical than if the cross-teeth were each formed or affixed to either of the surfaces, *d*, in a radial line, by which means the tendencies will be to penetrate the earth, and more effectually to break and crush the lumps of earth; and this added to the circumstance of each of the rolling surfaces being free to turn on their axes, and independent of each other, in place of being all affixed on their axes as heretofore, will render this machine much more useful than those heretofore constructed. When this machine is to be moved on roads, a pair of wheels, indicated by the red lines, *j, j*, are placed on either end of the axis, and when the machine is in use, these wheels are removed. Machines constructed as above described, will be found most useful for crushing and rolling land under various circumstances, particularly for crushing clods and breaking up strong land, also for rolling wheat as soon as sown, and also for rolling wheat upon light land in the spring after frost.

I will now describe the second part of my invention.

Fig. 3, shews a side view of a machine, constructed according to this part of my invention; and,

Fig. 4, is a plan; the seed-chest being removed in order to shew the other parts more clearly. *k, k*, is the framing of the machine which moves on four wheels, *l, l, l, l*,

the front pair of wheels being capable of producing a locking motion, as is well understood.

The object of this machine, is to cause narrow trenches or cuts to be formed at short intervals apart in grass-land, such cuts or narrow trenches passing through the turf into the soil below, and then by means of suitable drills to sow seed and manure into such trenches or narrow cuts. *m*, is an axis or shaft moving in bearings, at *n*, *n*: to this axis or shaft are affixed the arms, *o*, *o*, which, by connecting-links, move the bars, *p*, which slide in grooves at their ends; and to the bars, *p*, are affixed a series of blades or cutters, *q*, *q*, by passing through an opening formed in the upper part of each cutter; and such cutters pass through slits or openings in the plate, *r*; by this arrangement, whenever the cutters, *q*, *q*, become clogged, which they are very liable to do, the man attending the machine causes the cutters to be lifted, by which means, the matters adhering to the cutters will be removed; and the raising of the cutters, and the adjusting the depth to which they shall work, is accomplished by the levers, *s*, on each of which there is a sliding-weight, in order to regulate the pressure used to force the cutters through the turf. These levers, *s*, are affixed on the axis or shaft, *m*, *m*, as is shewn, and when it is desired to lift the cutters out of action to clear them, the person attending the machine raises the levers, and if he wishes to keep the cutters out of action, he will put a stop into a hole in the upper part of the curved-bar, *t*, under the lever, which will support the levers, *s*, and keep the cutters out of action; and according to the depth to which the cutters are desired to work, so will be the position of a stop inserted above the lever, in one of the holes formed in the lower part of the curved-bar, *t*; the curved-bar, *t*, being affixed to the side framing of the machine, as is shewn: and in order to raise the levers, *s*, the workman depresses the handle, *v*, on the two arms, *u*, such arms moving on

axes, *w*, as is shewn. *x*, are connecting-rods ; such connecting rod connecting the arms, *u*, with the lever, *s* ; hence the depressing of the handle, *v*, will cause the lever *s*, and, consequently, the cutters, to be lifted. The other parts shewn, are similar to the parts of ordinary drills, and are well understood, they will therefore require very little description here. The motion is taken from the back axis, *y*, by a cog-wheel affixed thereon, taking into and driving the cog-wheel, *y*¹, which takes into and drives a cog-wheel, *y*², which takes into and drives a cog-wheel, *y*³, of the drill. *z*, *z*, are the tubes of the drill. *A*, is the hopper, to which such tubes are attached ; *B*, is the seed and manure chest, which moves on necks or axes at either end, at *c*, *c*, and is capable of being correctly adjusted for working on a level plane, or up and down hill by means of the handle, *D*, the screw, *E*, the screw-wheel, *F*, and the bar with teeth, *G*, as is well understood.

Having thus described the nature of my invention, and the manner in which the same is to be performed, I would have it understood, that I make no claim to any of the parts separately, nor do I confine myself to the precise details, provided the peculiar character of either of my improvements be retained. But what I claim is, first, the mode of applying the teeth, *f*, of the rolling surfaces, *d*, for rolling and crushing land, as above described ; and I also claim the placing rolling surfaces, *d*, having teeth on their outer circumferences, in such manner as to turn independently of each other, as above described.

And secondly, I claim the mode of arranging a series of cutters in a suitable carriage, for producing narrow trenches or cuts through the turf of grass-land, whereby such cutters can be lifted and cleared from time to time, and combining therewith suitable drills for sowing seed and manure in such cuts or trenches as above described.—In witness whereof, &c.

WILLIAM CROSSKILL,

Enrolled March 8, 1842.

Specification of the Patent granted to JOSHUA FIELD, of Lambeth, Engineer, for an Improved Mode of Effecting the Operation of Connecting and Disconnecting from Steam-Engines, the Paddle-Wheels used for Steam Navigation.—Sealed March 22, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My improved mode of effecting the operation of connecting and disconnecting from steam-engines, the paddle-wheels used for steam navigation, consists in giving (when required) an end-way horizontal motion to the paddle-wheel, shaft, or horizontal axis, whereon the paddle-wheel, which is to be connected and disconnected, is mounted, in order that, by means of such end-way motion, the crank, which may for distinction be called the paddle-wheel crank, (because it is on the end of the said axis of the paddle-wheel,) can at pleasure, either be put in connection with, or can be withdrawn from connection with the extremity of the crank-pin, by which the aforesaid crank and paddle-wheel is usually turned round; for the crank-pin is fastened to, and projects out from, the other or fellow crank, which may, for distinction, be called the engine-crank, because it is turned round by action of the steam-engine, transmitted by means of the connecting-rod to the said crank-pin, which is so fastened, as aforesaid, to the said engine-crank. The connecting-rod being jointed on the said crank-pin, and operating thereon with upward-and-downward force alternately, has the effect of urging that crank-pin round in its intended circular orbit, and consequently turning the engine crank-rod, together with the horizontal axis to which that crank belongs. The extremity above mentioned of the crank-pin protrudes beyond the joint of the connecting-rod, and the protruding extremity is adapted to enter into a hole in the aforesaid paddle-wheel crank, whenever the paddle-

wheel is connected with the steam-engines, in order that the paddle-wheel crank may be carried round along with the crank-pin and engine-crank. In the most usual mode of constructing and applying the steam-engines used for steam navigation, the connection of each paddle-wheel with the steam-engine is effected by the protruding extremity of the crank-pin entering into a hole in the paddle-wheel crank, as above described, but no means are provided for disconnecting. By my improved mode, the axis of the paddle-wheel, together with the paddle-wheel itself, and the paddle-wheel crank being capable of being moved end-ways in the direction of the length of the said axis, the paddle-wheel crank can be approached towards the other fellow-crank or engine-crank, so that the afore-said protruding extremity of the crank-pin will become properly inserted into the hole in the paddle-wheel crank, in order to effect and secure the usual connection of the paddle-wheel with the steam-engines. But, when required, the axis of the paddle-wheel, with the paddle-wheel itself, and the paddle-wheel crank, can be moved in the direction of the said axis, so as to remove the paddle-wheel crank farther away from the engine-crank into the paddle-wheel crank, and is withdrawn quite out of the reach of the protruding end of the crank-pin, whereby the paddle-wheel will become entirely disconnected from the engines. And as to the mechanism whereby the axis of each of the paddle-wheels is to be moved end-ways, the same may be constructed in different ways, which will equally well produce the effect required, which is above stated; and it is important that the said mechanism should be adapted not only to move the axis of the paddle-wheels end-ways, as above described, with facility, but also to retain the axis securely as it has been placed, whether connected or disconnected, so that there can be no risk that the axis can change its condition unintentionally by any tendency resulting from the working of the engines, or from the motion of the steam-vessel in a

troubled sea, but from the construction of the said mechanism, it should be certain, that after the paddle-wheels have been once connected with the steam-engines by moving their respective axis end-ways, so as to connect their paddle-wheel cranks effectually and properly with the extremities of the crank-pins, as already explained, that there can be no risk of the said axes, or either of them, getting end-ways by any action of their own, or of the engines, or of the sea, so as to become disconnected, or partly disconnected, unless it is required for any reason to disconnect either or both of the paddle-wheels, and then the mechanism, which is provided for the purpose, must be capable, with facility, of moving the axis of that paddle-wheel end-ways, so much as is requisite in order to withdraw its paddle-wheel crank from all contact and connection with the said extremity of the crank-pin, so as thereby to effectually disconnect the said paddle-wheels from the steam-engines; but, from the construction of the said mechanism, it should be certain that the axis of the paddle-wheel so disconnected cannot get moved end-ways, so as to become partially or at all connected again by any action of its own, or of the engines, or of the sea. And each paddle-wheel is to be provided with such mechanism as aforesaid, so that either paddle-wheel can be connected or disconnected from the steam-engines, or both of the said wheels, as circumstances may require. And it will be requisite, either that the gudgeons or necks of the axes of the paddle-wheels should be made longer than the brasses or bearings, wherein such gudgeons or necks are lodged, in order that the said axes may admit of being moved end-ways, in manner aforesaid, within those brasses or bearings, or else that the said brasses or bearings themselves should be mounted on the supporting frame-work, in the manner of horizontal sliders, so as to be capable of moving in the direction of the length of the axis, in order to carry the same end-ways as much as is requisite for connecting or disconnecting, in

the manner above described. And also the space within the paddle-cases, wherein the paddle-wheels are enclosed, must be sufficient to admit of the paddle-wheels being moved by the aforesaid end-ways motion of their axes, as much as is requisite for the purpose of connecting and disconnecting in manner aforesaid, without risk of the paddle-wheels, or any part of them, touching the inside of the paddle-cases, or the framing therein. And for the more complete explanation of my said improved mode, I have hereunto annexed a drawing which contains representations of those parts of a steam-engine to which the improved mode has particular reference, viz., the axis of the paddle-wheel, and the paddle-wheel crank, also the engine-crank, and its crank-pin, and the axis of the latter crank, also the bearings for those axes, together with certain new mechanism for moving the axis of the paddle-wheel and its said crank end-ways, as hereinbefore described, that mechanism being constructed in one of the various ways in which the same may be constructed, but in a way which I esteem to be well adapted for practical use, and which will fully effect the intended purpose.

Description of the Drawing.

Fig. 1, is a longitudinal vertical section, taken across the direction of the axis of the paddle-wheel; and,

Fig. 2, is a transverse vertical section, taken in the direction of the length of the said axis; and,

Fig. 3, is a horizontal plan. The same letters of reference are used to denote the same parts in all the three figures. *A*, is the axis of the paddle-wheel, and *B*, the paddle-wheel crank on the end of that axis. *c*, is the iron framing to sustain the neck of the axis, *A*; and *b*, is the lowermost brass of the bearing whereon the neck, *a*, of that axis rests and revolves. *d*, is the engine-crank, and *E*, the axis thereof. *F*, the iron framing to sustain it. *f*, is the lowermost brass; and *g*, the uppermost brass of the bearing, wherein the necks of the axis, *E*, revolves;

and *c*, is the cap or upper part of that bearing which keeps the uppermost brass, *a*, in place over the said neck of the axes, *e*, *h*. *h*, is the crank-pin, which is fastened firmly into the engine-crank, *d*, and projects out horizontally therefrom; *h*, being the part whereon the joint of the connecting-rod is fitted, and *h*, the protruding extremity of the pin, which enters into a hole in the end of the paddle-wheel crank, *b*, as shewn at fig. 2: at least that is the case when the paddle-wheel is connected with the steam-engine, and is the case in the ordinary construction—for every thing that has been above described in respect to the drawings, is the ordinary construction, and forms no part of my improved mode;—but the lines drawn in red ink at *x*, represent the position which, according to my said improved mode, the paddle-wheel crank, *b*, assumes, when the axis, *A*, of the paddle-wheel has been moved end-ways, as hereinbefore described, so as to be withdrawn from the protruding extremity, *h*, of the crank-pin, whereby the paddle-wheel crank, *b*, (and consequently the paddle-wheel,) becomes wholly disconnected from the engines. It may be seen in fig. 2, that the neck, *a*, of the axis, *A*, of the paddle-wheel crank, *b*, is as much longer than the length of the lowermost branch, *b*, of the bearing for that neck, *a*, as will permit the axis, *A*, to be moved end-ways in the said bearing, as much as will remove the paddle-wheel crank, *b*, from the position represented in fig. 2, to the position represented by the red lines, *x*, in the same figure, in order to effect the connection or disconnection of, according to my said improved mode, in the manner already explained. The whole of the mechanism for moving the axis end-ways is represented in the drawing to be applied in the cap, *i*, of the bearing for the neck, *a*, of the axis of the paddle-wheel, in the following manner:—The uppermost brass, *d*, of the said bearing is fitted into the cap, *i*, so as to be capable of sliding horizontally therein in the direction of the length of the axis; the said uppermost brass, *d*, as is

shewn in fig. 2, occupies the whole length of the neck, *a*, of the axis, *A*, so as to fill up between the shoulders of that neck, although the lowermost brass, *b*, of the same bearing is, as before mentioned, shorter than the said neck, *a*, that lowermost brass being fixed in the usual manner in its bearing, *c*, with liberty of moving or sliding therein. And in order to move or slide the uppermost brass, *d*, in its cap, *i*, an eccentric circle, *k*, is applied over the said brass, the eccentric being interposed in the space between the top of the brass, *d*, and the underside of the cap, *i*. The eccentric, *k*, is on the lowermost end of an upright axle, *l*, which passes down through a vertical socket, *m*, that is formed on the top of the cap, *i*, and on the upper end of the axis, *l*, a toothed-wheel, *i*, is fixed, in order to turn the axis, *l*, round, and, consequently, the eccentric, *k*, at the same time with the axis. The eccentric, *k*, is included within a recess formed in the upper side of the uppermost brass, *d*, and the circumference of the eccentric touches the two sides of that recess, which sides are horizontal straight edges, parallel one to the other, in a direction across the length of the axis, *A*, the diameter of the eccentric circle, *k*, exactly fills the space between the said two parallel straight edges, so that the eccentric, *k*, being turned round, or half round, will, by acting between the said parallel edges, move or slide the uppermost brass, *d*, end-ways, within the cap, *i*, and thereby the axis, *A*, of the paddle-wheels, together with the paddle-wheel crank, *n*, will be moved end-ways in its lowermost bearing brass, which, as already stated, is shorter than the neck, *a*, which rests and revolves in the brass, *b*; but in consequence of the uppermost brass, *d*, occupying all the length of the neck, *a*, and filling up between the two shoulders thereof, the said uppermost brass, *d*, when moved end-ways within its cap, *i*, as above described, cannot fail to move the axis, *A*, end-ways along with it, together with the paddle-wheel crank, *n*, as well as the paddle-wheel itself. The eccentric circle, *k*, is

shewn in the section, fig. 2, and by dotted lines in the plan, fig. 3, with the eccentricity thereof turned towards the crank, as is the case when the paddle-wheel is connected with the steam-engine, and as is represented in fig. 2; but when the upright axis, *l*, of the eccentric, *k*, has been turned half round, so that the eccentricity of the circle, *k*, becomes turned away from the cranks, then it will have moved or slid the uppermost brass, *d*, end-ways, within the cap, *1*, and thereby will have moved the axis, *A*, of the paddle-wheel so much end-ways, as to place the same with its paddle-wheel crank, *B*, in the position shewn by the red lines, *x*, in fig. 2, and in which position the paddle-wheel is disconnected from the steam-engines, as already stated. The upright axis, *l*, of the eccentric circle, *k*, may be turned round very conveniently by means of a toothed-wheel, *i*, fastened on the upper end of that axis, and having its teeth engaged by a worm or endless-screw, *p*, a prolongation, *n*, of the axis of that screw may be extended to any accessible and convenient place for applying a turning handle, *o*, by which the screw, *p*, can be turned round, and, consequently, the toothed-wheel, *i*, together with its axis, *l*, and the eccentric circle, *k*, will be turned slowly round, but with great force, in order to move or slide the uppermost brass, *d*, within the cap, *1*, and thereby to move the axis, *A*, of the paddle-wheels and its crank, *B*, end-ways, for the purpose of effecting the operation of connecting and disconnecting the paddle-wheels from the steam-engines, as already explained. The cap, *1*, of the bearing for the axis, *A*, of the paddle-wheel, is fastened down by four screw-bolts, with nuts on the upper ends of them, in the usual manner; and the cap, *1*, should be fitted into its place in the lower part of the bearing, which is part of the iron framing, *c*, with projections on the cap, to interlock into corresponding cavities in the said lower part of the bearing, as is very commonly done, in order to retain the cap, *1*, very securely in place, in the direction of the length of the

said axis, *A*, by such interlocking, as an additional security to the screw-bolts, so as to prevent any risk of the caps being dislodged by force, acting in the direction of the length of the axis, *A*. The socket, *m*, for the reception of the vertical axis, *l*, of the eccentric circle, *κ*, is a short column on the top of the cap, *i*; and from the upper end of that column, an arm projects out horizontally on the side towards the paddle-wheel, in order to support two bearings for the screw, *p*, as is sufficiently explained by the drawing. The screw, *p*, may be a double spiral thread, in which case it will, at every revolution given by its handles, *o*, turn the wheel, *l*, two of the teeth thereof. It is not necessary that the toothed-wheel, *i*, should be a complete circle, for if its teeth extend around somewhat more than half its circumference, they would be sufficient, because the eccentric circle, *κ*, only requires to be turned half round, and then to be turned back again, in order to effect the intended operation of connecting and disconnecting; but if the wheel, *i*, is toothed around its circumference, then the eccentric may be turned around in either direction, in order to effect the operation aforesaid; and after having been turned half round, then, instead of turning back again, it may be turned onwards another half turn in the same direction, and will thereby effect the said operation; but in all cases the eccentric circle, *κ*, must be placed so as to have the eccentricity thereof directed truly towards the cranks, as shewn in the drawing, when the paddle-wheel is to be connected, or, with the said eccentricity thereof directed truly towards the paddle-wheel. When the paddle-wheel is disconnected, the toothed-wheel, *i*, should have suitable marks upon it, to shew when the eccentric is properly fixed for connecting and disconnecting, as aforesaid. And note; the other bearing for the outer or overboard part of the axis, *A*, of the paddle-wheel, and the space left for the paddle-wheel within the paddle-box or case, must be all suitably adapted to permit of the axis, *A*, being moved end-ways, as much

as is requisite for effecting the operation of connecting or disconnecting in the manner already described, without any impediment to such moving end-ways. And more effectually to secure the axis, *A*, as it has been placed, whether connected or disconnected, I propose to apply two pauls or stops, mounted on horizontal centre-pins, *t, t*, (see figs. 1 and 3), on each side of the iron framing, *c*, in such a manner that when the cranks are connected, the two pauls, *r, r*, which are fixed in the same side of the frame, *c*, as the crank, *B*, shall fit into two notches in the upper moveable brass, *d*, as is shewn by the dotted lines in fig. 1, and also in fig. 3, and thereby prevent the possibility of the axis, *A*, sliding or moving outwards, and becoming disconnected from the engine, the two parts, *s, s*, on the side of the framing, *c*, next to the paddle-wheel, being at that time out of action, and removed from the brass, *d*, as is shewn in figs. 1 and 3. Before disconnecting the paddle-wheel from the engine, in the manner hereinbefore described, the two pauls, *r, r*, must be removed from the notches on the brass, *d*; and after the operation of disconnecting has been performed, and the brass, *d*, moved into the position shewn by the red lines in fig. 2, the two points, *s, s*, on the frame, *c*, next to the paddle-wheel, are to be turned up and allowed to enter into notches in that end of the brass, *d*, which is nearest the paddle-wheel, and thereby prevent the possibility of the axis, *A*, sliding or moving inwards, and becoming connected with the engine; the two pauls, *r, r*, being at the same time out of action. All that is represented in the drawing relates to one paddle-wheel, and the other paddle-wheel will require to have a duplicate of the mechanism represented as above described. The mechanism for moving the axis of the paddle-wheel end-ways may be constructed in various ways; for instance, with levers in place of the worm and wheel, or with other mechanical powers combined, so as to be different from the above, but so as to produce the same result: nevertheless,

I consider the above to be as well adapted to the purpose as any other way. And note, when the paddle-wheel is disconnected, and it is required to connect it again, the paddle-wheel must be turned round, or else the engines, or both the paddle-wheel and engines, may be turned round respectively, until the paddle-wheel crank, *b*, is brought round to stand exactly opposite to the engine-crank, *d*, so that the protruding extremity, *h*, of the crank-pin will be exactly opposite to the hole in the engine-crank, *b*, which is to receive that extremity; and it is whilst the cranks are kept steadily so placed, that the handle, *o*, is to be turned, in order to move the axis of the paddle-wheel end-ways, and effect the connecting. And for the convenience of turning the paddle-wheel round when it is disconnected, and of keeping the wheel steady after it has been properly placed, and until it is connected, as aforesaid, one of the circular rims of the paddle-wheel may have teeth formed around its circumference, and a long pinion or pinions may be mounted in a frame, so that they can be applied to engage with those teeth when required, the said pinions having winch-handles, by which they can be turned round by men, in order to turn the paddle-wheel round and retain it steady, as required. This contrivance is not a new proposal, and is not claimed as any part of the present invention, but it may be advantageously used therewith.

Having now described my said improved mode of effecting the operation of connecting and disconnecting from steam-engines the paddle-wheels used for steam navigation, I, the said Joshua Field, do hereby declare that the new invention, whereof the exclusive use is granted to me by the aforesaid letters patent, consists in the mode, hereinbefore described, of moving the axis of the paddle-wheel end-ways, in the direction of its length, by means of suitable mechanism, so that the paddle-wheel crank may be approached towards, or removed away from, the extremity of the crank-pin of the engine-crank, with as

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much motion as is requisite in order to effect the operation of connecting and disconnecting the paddle-wheel from the engines.—In witness whereof, &c.

JOSHUA FIELD.

Enrolled September 22, 1841.

Specification of the Patent granted to JOHN RIDGWAY, of Cauldon Place, in the County of Stafford, China Manufacturer, for certain Improvements in the Moulds used in the Manufacture of Earthenware, Porcelain, and other similar Substances, whereby such Moulds are rendered more Durable.—Sealed January 6, 1840.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My improvements in the moulds used in the manufacture of earthenware, porcelain, and other similar substances, whereby such moulds are rendered more durable, consists in the union or combination of two suitable substances to form the mould for shaping or working earthenware or porcelain, instead of making the mould of one substance or material throughout. The face of the mould which gives the shape or form to the article to be moulded is to be composed of a thin layer of the substance usually denominated “pitcher” (this term being well understood by potters and persons conversant with such manufacture), and is to consist of a mixture of, say eight pounds, of flint, two-and-a-half pounds of blue clay, and one pound of china clay, more or less, as may be found most desirable, and baked, which is then to be backed and strengthened by a composition-back, consisting of, say three parts, of sand, two of Roman cement, and one of plaster of Paris, the whole mixed with water, whereby, after standing, it becomes hard and durable. The union of these two substance to form the mould will allow it to

receive any form or size most convenient for use. For the sake of illustration, I have attached to these presents a sheet of drawings, in which

Description of the Drawings.

Fig. 1, is a face view.

Fig. 2, an edge view ; and,

Fig. 3, a section of the mould. The "pitcher" face being represented at *a, a, a*, and the composition-back, *b, b, b*.

Having now particularly described the nature of my said invention, and the manner in which the same is to be performed, I desire it to be particularly understood that I do not intend to confine myself to the exact proportion or materials, either of the "pitcher" face, or of the composition-back, for moulds, as it may be necessary to vary the same in order to suit convenience ; but I include all or any materials whatever, which, being baked, come under the general denomination of "pitcher" for the face of moulds, and also any materials, metals, or modification whatever to form the back of moulds ; but I claim as my invention the union or combination of the two parts constituting a "pitcher" face, and a composition mixed, or metal back, to form moulds used in the manufacture of earthenware, porcelain, and other similar substances.—
In witness, &c.

JOHN RIDGWAY.

Enrolled July 6, 1840.

*Specification of the Patent granted to WILLIAM WIN-
SON, of Rathbone Place, Artists' Colourman, for a
certain Method or Methods of Preserving and Using
Colours.*—Sealed February 23, 1840.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—
My said improvements in preserving and using colours,
consist in the substitution of cylindrical tubes of glass or
other substances as hereinafter mentioned, instead of
bladder or membrane, as now generally used. These
tubes are open at both ends, and have an external rim,
border, or flanch, made around them, to admit of having
any flexible membranes, textile, or woven substance, being
tied or otherwise properly secured over one or both ends
of the tubes. Into each of these tubes, I fix a piston
having a female-screw formed in its centre, and into
which a male-screw is fitted. This screw is as long or
rather longer than the tube. I form my piston of a
number of thin circular pieces, discs, or plates of cork,
or other elastic substances, or materials with alternate
discs of paper, card, or other similar materials, not how-
ever so elastic as cork, interposed between them; or I
can compose it entirely of plates or discs of cork, without
the interposition of other substances. These circular
discs or plates of cork, card, or other materials, have cir-
cular or other shaped holes in their centres, which allow
them to be arranged upon a cylindrical or other shaped
block, made of hardened ivory, bone, horn, metal, or of
any other material, which is capable of being turned,
cast, or otherwise formed, and either round, square, or of
other shapes. This block has a female-screw formed
within its centre, to fit the male-screw above mentioned,
and likewise a circular or cylindrical plate of a larger
diameter, formed upon one end of it; the circular discs
or plates of cork, having any other and smaller discs of

card placed between them, are arranged upon this central block, and secured upon it by means of gum, glue, or preferably of mixtures thereof, or with paste, gum, resin, caoutchouc, or other proper cements, employed according to the nature of the various colours or their vehicles, which are intended to be contained in my colour preserves, and whether the same may be of any oleaginous, aqueous, spirituous, gummin, resinous, or other nature, so that the cements used in fastening the circular plates or discs upon the block, shall not be soluble in the liquid with which the paint or colour is prepared. The male-screw may likewise be made of metal, ivory, bone, horn, tortoiseshell, or any other suitable material, and have a coarse thread formed upon it from its point nearly to its head, that part being left solid for the sake of strength, and to affix firmly upon it a flat circular or other shaped plate or head, to act as a lever in turning the screw. The circular discs or plates, whether of cork, card, or other materials, of which the piston chiefly consists, may be formed by means of two circular punches, a small one being in the centre to form a hole or aperture in the plate or discs, &c., a larger one to cut the outer circle concentric with the hole or aperture. By these means, I cut, stamp, or punch the discs or circular plates, either out of cork, previously sliced thin, or from card-board, leather, or other suitable materials. I, however, prefer to make the piston of cork and card-board, placed alternately, and fastened or connected firmly one upon another to the block containing the female-screw in its centre.

Description of the Drawing.

I fit or place the piston thus formed into one end of a tube, A, fig. 1 of the annexed drawing, and as shewn at B, in fig. 2. I then take a flat circular plate or disc, c, made either of ivory, bone, wood, metal, or other suitable materials, and which is large or rather larger in

diameter than the tube, and secure it upon that end of the tube next to the piston, as shewn at fig. 3, by tying or otherwise firmly affixing over it a piece of membrane, **E**; such for instance, as bladder or the lining of the oesophagus of cattle, or of cloth, leather, or any other suitable flexible material, and which is large enough to reach just below the rim or flanch, **D**, as shewn in fig. 3. This plate or disc, **C**, is so fastened upon the end of the tube, **A**, which has a circular hole or aperture in its centre, large enough to permit the male-screw, **E**, fig. 4, to pass through it, without touching the plate. The bladder or other membrane, cloth, leather, &c., **E**, has a hole perforated or cut through it, above the hole formed in the centre of the plate or disc, **C**, and the male-screw, **F**, fig. 4, (and which is rather longer than the tube, **A**,) passes freely through the holes in the membrane, &c., and in the plate or disc, **C**, and acts or works in the female-screw formed in the centre of the wooden-boss, **G**, of the piston, **B**. The screw, **F**, is then turned round within the female-screw, **G**, until its point reaches to the opposite end of the tube, **A**, the piston, **B**, remaining in the tube near to the head of the screw, and indeed, in the place where it was first posited, and as shewn in fig. 4. I then fill the tube, **A**, with the colour or paint which I intend to keep or preserve in its ground or prepared state, mixed with its proper vehicle or vehicles in a thick or pasty consistence; I then cover and secure that end of the tube, **A**, which yet remains open, with another flat circular disc or plate, **H**, fig. 5, having an aperture or hole in its centre, and also a membranous or other suitable elastic material, is bound or tied over it, and around the opposite end, **J**, of the tube, **A**, in a similar manner to that already described in closing the other end of the tube. I prefer to have the central aperture in the plate or disc, **H**, about the sixteenth part of an inch in diameter, to permit the colour to be forced out for use on piercing the membrane, or other elastic covering, and

driving the piston forwards, in the manner to be afterwards described. And I afterwards close those openings by thrusting a plug, *J*, fig. 6, therein, made of ivory, bone, hard wood, or other suitable materials, and as shewn at fig. 7; where likewise all the other parts, before enumerated and described, are seen in their places. *B*, fig. 6, is the piston shewn separately. It is composed of the hard wood block, *G*, having a screwed hole in its centre, and an enlarged part, *K*; and upon it are affixed and secured, by gum, glue, or mixtures thereof, or by any other fit and proper cement, the larger cork, or other elastic circular plates or discs, *L*, one of which is shewn separately in fig. 9, and interposed between them and the smaller and less elastic card, card-board, &c., discs, *M*, one of which is likewise shewn separately at *M*, in fig. 10. The block, *G*, *K*, is also shewn in section, at fig. 11, and in plan, in fig. 12. *F*, fig. 13, is the male screw, shewn separately and in section: the manner of affixing its head, or flat circular plate, or lever, *N*, upon it, by rivetting it, as here shewn. When only colour is required for use, I take out the plug, *J*, or stopper, and then give the screw, *F*, a few backward turns by means of its circular plate, or lever, *N*, and thus withdraw it a little out of the tube, *A*, leaving the piston stationary, or not turned round. I then push against the flat circular plate, *N*, but without turning it round, and thus force the piston forwards, the colour in the tube will then be driven out through the aperture in the centre of the circular plate, *H*, upon the palette, or other proper receptacle for it. I then replace the plug, *J*. This process must be repeated as often as colour is required for use, and until all the colours which the tube held is driven out before the piston, and the latter has arrived at the end of the tube. In order to recharge the tube with colour, the piston must be drawn back to its original situation by pulling the circular-plate, *N*, without turning it round. The membranous or other flexible material, *I*, covering and securing the flat circular

plate, H, upon the end of the tube, A, must be removed by cutting it away, and likewise that plate. The tube can then be re-charged with colour, after which the plate, H, must be again secured in its place, by covering it with a membranous or other fit and proper elastic cover as at first; and in order to protect the said membranous, or other elastic material, covering the ends of the tube, A, from moisture, by which it might be injured, and likewise to prevent the air from passing through the said membranous or elastic covering, and whereby the colour contained in the tube might also be injured, I varnish the said membranous, or other elastic covering, either with hard white spirit-varnish, copal-varnish, or seed, or shell-lac varnish, or with any other soluble varnish, these being varnishes commonly known, and sold ready for use. And as various colours, the component parts whereof might exercise a prejudicial effect upon the material or materials of which the screw, F, is composed, unless properly guarded against, so I likewise defend it therefrom by coating it with any of the before named varnishes, or lacquering it with the varnish commonly sold and known as lacquer, in which case I make this screw hot, and then immediately dip it in the lacquer. When I wish to preserve the colours contained in the tubes for a considerable length of time uninjured, I avoid puncturing the membranous or other flexible or caustic coverings at the ends of the tubes, and leave them entire. The holes for the entrance of the screws and plugs must then be made by incision at the time when the colours are required for use.

It will be seen from the above statement, that my patent colour-preserves or tubes have not any long stem or handle projecting therefrom, as in the case of the ordinary syringes, which have been already applied to a similar purpose; but the rod, stem, or handle, is made to extend by screwing, as above, so as to become elongated, and sufficiently so to expel the paint; and hence it follows, that my improved colour-preserves can be retained or held

in much less space, and in a more convenient form, for use, when charged with colour, than others ; in fact, they can be held in one hand only, and the colour be driven out upon the palette, &c., by merely holding the tube between two of the fingers, and thrusting the piston forward by the action of the thumb pressing against the flat circular-plate, N, upon the head of the screw. I can likewise still further improve the action of the screw, F, so as to prevent the necessity of withdrawing it out of the tube, A, by firmly affixing a flat circular plate or stop, O, fig. 14, upon the head of the screw, F, and which acts against the inner side of the flat circular plate, D ; and thus, by merely turning the screw, F, by means of its flat circular plate or lever, N, either in one direction or in the opposite one, the male screw, F, working in the female screw within the block, G, of the piston, will either force the piston, B, forwards, or retract it at pleasure. In order to avoid the necessity of moving or replacing the membranous or other elastic material covering the plate, U, at the lower end of the tube, A, on recharging it with colour, I can cement a screwed-ring, P, fig. 15, formed either of hard wood, bone, ivory, or other fit and proper materials, upon that end of the tube, to receive a female screw, formed within the rim of a flat circular plate or disc, Q, having a hole or aperture in its centre to receive the plug, J : this disc, Q, may likewise be made of similar materials with the ring, P. A reverse of this latter improvement may be effected in the manner shewn at fig. 16, where R, shews a wooden or other ring, as cemented upon the end of the tube, A, but which said ring has a female screw formed within it, to receive a male screw made round the rim of a flat circular plate or disc, S, within it, and by means of which that end of the tube, A, can be also securely closed. A hole is also formed in the centre of the disc, S, to admit the plug, J. Two other methods of partially closing the ends of the glass-tube, A, are shewn at fig. 17 : here the lower end of it is contracted in the blowing of the glass,

having only a small aperture to receive the plug, *j*, fig. 18. The other end of the tube, *A*, has a ring of ivory, bone, hard wood, metal, or other suitable material or materials, *r*, slipped upon it, and resting against the external flanch, as before described, which is formed at that end of the tube. Into the screwed-ring, *r*, a male screw formed around a circular plate or disc, *v*, is fitted, on the centre of which is a hole through which the screw, *r*, of the piston passes freely, and without acting or working in the said hole; indeed in the very same manner described in the reference to fig. 3. For some purposes I make my said colour-preserves of plain tubes without external flanches; but in this instance it is necessary to unite the flexible membrane, or other elastic material, covering their ends very firmly, either by means of cement, or by tying them tightly before varnishing them exteriorly. Instead of covering the bottom end of my tubes, I can close the same by cementing therein a block or stopper, having an aperture in it to allow of the expulsion of the colour. The cements I usually employ are any of the gum resins, such as gum-copal, gum-mastic, sandarch, or shell-lac, melted, and applied hot; but any other cement, which will hold the said block firmly in the tube, may be substituted.—(Fig. 22, represents a tube of this construction).—In order to preserve in my colour-preserves those colours which have been moulded or formed into cakes, in the usual manner of preparing them, for the use of painters in water-colours, I grossly powder them, and then keep or preserve them in the dry powdered state. When any of these are wanted for use, I put some of the powdered colour into one or more of my patent-tubes, and pour a quantity of water, or other fit and proper vehicle, into the tubes, sufficient to bring the colours into a pasty consistence, when they may be treated or preserved therein in the very same manner as though they had originally been prepared in the pasty state.

As I generally prefer glass to form my tubes or colour-

preserves of, and this material being fragile, so it becomes desirable to provide for their safe and convenient keeping, transporting, and using. In order to this I have contrived the following means:—In fig. 19, v, represents, in perspective, a box or case made of wood or other fit and proper materials, and having a lid or cover, w, hinged to it. In this box or case, v, are shewn a row of twelve of my patent glass-tubes, or colour-preserves, A, A, A, A, A, A, A, A, A, A, A, A, with their plugs lying within a wooden tray, with two wire handles, which is shewn in perspective, in fig. 19*; and likewise in the front view or section, fig. 20, at x. The screws, F, F, &c., near their opposite ends or flat circular-plates, N, N, &c., resting or lying upon the other side or end of the tray, x, x, x, as is shewn in one of them, in fig. 20. Fig. 19*, also exhibits a cushion or pad, y, as being affixed upon the under side of the lid or cover, w, of the box or case, and which, pressing upon the tubes when the lid is closed and secured fast, and as shewn in the front section, fig. 20, keeps or retains them firmly in their places, in carriage travelling, &c.; and when two or more trays are contained in a box or case, v, the underside of each tray is likewise furnished with a similar cushion, y. Fig. 21, is part of an end section, for shewing the bar, x, the glass tube, A, and the flat circular-disc or plate, N, of one of my colour-preserving tubes. Instead of a screw, I can employ a square or flat metal rod, having one or two of its sides formed into a toothed-rack or racks, &c., passing through a square hole or aperture, or a hole made in the form of a parallelogram, made in the block in the centre of the piston, and to which said block, a spring or springs must be affixed, acting in the said rack or racks, and allowing the rod to be drawn outwards without moving the piston; but upon pushing it inwards, the spring or springs act or acts in the teeth of the rack or racks, and thus the piston may be pushed forward (see fig. 23.) And whereas I have mentioned glass or other substances, as the materials of which the tubes are to be

made, I here explain, that I generally prefer glass, but other materials may be used, such as earthenware or porcelain glazed, metals, such as pewter or tinned iron; but no substance is in general so convenient and eligible as glass. One of the chief merits of my said invention for preserving and using colours, where glass is used, consists in retaining or holding them in clear glass-tubes, thereby enabling the artist to distinguish each colour instantly; whereas they have hitherto generally been contained in bladders or membranes, or in metal cases, which, by their partial or entire opacity, hinder that clear and distinct view of each colour from taking place. Instead of closing the bottom end of my tubes with a flat circular-disc or plate, I can likewise close them with convex, conical, or other slightly projecting discs or plates, such for instance as those shewn at figs. 24 and 25.

Now, being aware that glass-tubes have been used for sample bottles, I do not mean to claim in any respect the use of glass for the purpose of merely preserving or exhibiting colours; nor do I mean to claim the separate use of any of the tubes, pistons, screws, or other parts or materials herein mentioned; but I claim as my invention the method of preserving and using colours by substituting tubes of glass, or other materials, in the manner herein described, instead of the method hitherto practised.—In witness whereof, &c.

WILLIAM WINSOR.

Enrolled August 22, 1840.

Specification of the Patent granted to EZRA JENK COATES, of Bread Street, Cheapside, in the City of London, Merchant, for certain Improvements in Propelling Canal and other Boats.—Sealed June 13, 1840.

WITH AN ENGRAVING.

To all to whom the sepresents shall come, &c.&c.—
These improvements in propelling canal and other boats, consist in the employment of an endless chain or band, made either of metallic or suitable substances, and furnished, if requisite, with a series of small anchors or catches. The chain is passed over pulleys situated at the stem and stern of the boat or vessel, and allowed to lie on the bottom of the river or canal, and upon rotary motion being communicated to the pulleys above mentioned, they, from their being in direct contact with the chain, cause the boat or vessel to be moved or propelled forward, in consequence of the hold or resistance the endless chains or anchors have against or upon the bottom of the canal or river by the action of the front pulley, as the vessel advances, the pulley at the stern of the boat raising the chain from off the ground, and the chain passing over antifricition rollers to the front part of the boat or vessel, from whence it is delivered on to the ground as before mentioned. In order that my invention may be fully understood, I have shewn in the accompanying drawing, two methods in which this invention may be carried into effect. Similar letters of reference denote corresponding parts in all the figures.

Description of the Drawing.

Fig. 1, represents a section of a boat or vessel, constructed so as to be propelled by this invention.

This vessel may be called a steam-drag or tug, and is intended to be used in canals or rivers, to draw a number

of boats or barges ; after which, it may be connected by cables or otherwise, as shewn in fig. 2. The endless chain is marked, *a, a*, in fig. 1, and is furnished with anchors, *b, b*. The driving or actuating-wheel, *c*, (which in this instance is shewn as placed in front of the boat.) has teeth or spikes formed on its periphery, which take into the openings or links of the chain or endless bell, a detached portion of which, together with one of the anchors connected to it, are shewn in perspective, at fig. 3.

Fig. 4, is a partial side elevation of the said driving-wheel ; and,

Fig. 5, is a plan view of the same.

The other wheel is shewn in partial elevation and plan, at figs. 6, and 7, and need not have any rotary motion communicated to it, except that derived from the friction of the chain in passing over its periphery. The endless chain is passed over and supported by several antifriction rollers, *d, d*, for the purpose of facilitating its progress, the open or driving-wheel being caused to revolve by the application of the power of a steam-engine or other mechanical means.

In figs. 1 and 3, I have shewn small anchors or catches or holders attached to the endless chain ; yet, under some circumstances, it may be found that by increasing the weight of the chain alone, with such additional weight, will have sufficient hold or friction on the ground, to enable the steam-drag to draw the boats or barges attached to it. This modification of the invention is shewn at fig. 8, and may be found to answer the purpose, and it will not disturb the bottom of the canal or river, so much as the construction shewn in figs. 1 and 3 ; but where a considerable number of barges are attached to one tug-boat, then it will be found necessary to employ a chain constructed in the manner shewn in fig. 3, in order to be able to tow a greater number of boats at a time.

Having thus described the invention communicated

to me, and the manner of carrying the same into effect, I wish it to be understood, that I claim as the invention secured to me, by the hereinbefore in part recited letters patent, propelling vessels on rivers or canals, by means of an endless chain or band passed over pulleys, situated at the stem or stern of a tug-boat or vessel, and having part of its length lying along the bottom of the river or canal, for the purpose of obtaining a hold thereon, or means of resistance therefrom, as above described, whether such endless chain is used in conjunction with anchors or not.—In witness whereof, &c.

EZRA JENK COATES.

Enrolled December 13, 1840.

Specification of the Patent granted to WILLIAM JEAKES, of Great Russell Street, Bloomsbury, in the County of Middlesex, Ironmonger, for a Mode of applying Ventilating Apparatus to Stoves constructed on Dr. Arnott's principle.—Sealed October 22, 1838.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My invention of a mode applying ventilating apparatus to stoves, constructed on Dr. Arnott's principle, will be seen by reference to the drawing accompanying this my specification, in which

Description of the Drawing,

Fig. 1, is an external view or elevation of the stove.

Fig. 2, is a section of the same, taken vertically through the middle of the stove; and,

Fig. 3, a horizontal section of the same. *a*, is the furnace containing the ignited fuel in the interior of a box, *b, b, b*, the lower part of which is lined with fire-brick, at *c, c*, the grating or fire-bars are shewn at *d*; and *e, e*,

is the ash-pit, the air to support combustion being admitted through an adjustable ventilator in front of the ash-pit. The fuel is supplied at the door, *f*; and the smoke, rising into the upper part of the box, passes off through the lateral pipe, *g*, into the chimney, *h*. The upper part of the box, *b, b*, is closed by a lid, *i*, having flanges which fall into a groove filled with sand round the top-edge of the box, and forming a sand-packing.

Such is the ordinary construction of Dr. Arnott's stove, as described in his published treatise on that subject; now my invention is an improvement on Dr. Arnott's stove, consisting of an appendage, by which a current of cold and pure atmospheric air may be brought in contact with the sides of the stove; and after being heated by that means may be discharged into the room, for the purpose of warming its atmosphere. I surround the stove entirely by a casing, *k, k, k, k*, which incloses it, forming air passages all round; and by means of a pipe or tube, *e*, leading from any convenient opening, introduce atmospheric-air, either from without the house or from any other apartment. This air is brought through an opening in the bottom of the casing, at *m*, into the lower part of the chamber; and from thence rises up the passages, *n, n*, at the side of the stove, taking up the heat as it passes, and is ultimately discharged through the openings in the top, at *o, o*, into the room. By these means a constant current of warm air is supplied to the room, and that air which is cold, or has been rendered heavy by respiration, is drawn off through an opening, *p*, and carried up a pipe, *q*, into the chimney: thus a constant circulation of the air in the room is effected, and a perfect ventilation obtained, which will be found to be of great relief in a close room, where one of Dr. Arnott's stoves is used, having, as they always have, the mouth of the chimney closed at bottom. When it is not required to introduce cold atmospheric-air from without, I exclude it, by

moving the slide, *r*, under the opening, *m*, which shuts off the communication with the pipe or tube, *l*, and opens an aperture, *s*; through this aperture the air of the room now passes in a current up the channels, *n, n*, by the sides of the stove, and it is discharged at top in a heated state; thus producing a circulation of air which warms the apartments: and if it is not considered necessary to withdraw the colder or heavier parts of the air from the room, I close the aperture, *p*, of the pipe or tube, *q*, and shut off that communication with the chimney.—In witness whereof, &c.

WILLIAM JEAKES.

Enrolled April 22, 1839.

Specification of the Patent granted to JAMES TEMPLETON, Manufacturer, in Paisley, and WILLIAM QUIGLAY, Weaver, in Paisley, for an Improved Mode of Manufacturing Silk, Cotton, Woollen, and Linen Fabrics.
—Sealed July 25, 1839.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—The nature of the said invention consists in weaving fabrics of silk, cotton, woollen, linen, or other fibrous materials, which are to be cut into stripes, and used as weft, somewhat in the manner of chenille-weft, but with this difference, that the two edges of the stripe shall incline more toward each other, and then weaving such stripes on a ground, so that all the fur or cut edges of the stripes may be brought to the one side or surface of the fabric, while the other side is plain; and which invention is applicable to the manufacture of carpets, rugs, shawls, mats, covers of stools, chairs or tables, tapestry or any cloth or fabric requiring to be raised, so as to have the appearance of arched fur or plush. And we declare the

manner in which the same is to be performed is as follows :—A texture or fabric of silk, cotton, wollen, linen, or of a mixture of two or more of these materials, is first to be wove, having the warp spaced or set in the reed at certain equal distances from each other, leaving an empty space in the reed between ; viz., one, two, or more splits of the reed are filled with the warp threads, and then a space of the reed is left empty equal to double the length of the fur required ; one, two, or more splits of the reed are again filled with the warp threads, then another empty space, as above described, and so repeating until the full number of the stripes required is completed. The warp being thus spaced or arranged in the loom, the weft or woof is then thrown in, so as to form either a one coloured or varied coloured surface, and the warp operates on the weft, by a combination of what is technically called by weavers and manufacturers gauze or cross-weaving, that is, the threads of warp, instead of being left parallel to each other, as in common weaving, are crossed over each other by each thread on the trebble or web-mountings ; and the weft when thrown in, and which is to form the fur or pile, intersects the warp and acquires the property of its edges being inclined or having a tendency to come together, in consequence of the cross-weaving which the warp has received, and on this, which is cut into stripes through the vacant space already described, the weft or lateral fabrics of both sides of each stripe are thrown up on one side, and brought close together. The process is somewhat similar to that followed in making chenille-weft, but with this difference, that the fur or pile, that is to say, the lateral fibres of both ends of each stripe when cut, are all brought up on one side and into close compact, instead of projecting from all sides of the warp or body-thread, as in the case of chenille-weft. The same effect may be produced by various kinds of cross-weaving, which it is unnecessary for us here to describe.

Description of the Drawing.

The drawings in the margin hereof represent two modes of our cross-weaving, exhibiting the crossings of the warp and intersections of the weft.

In No. 1, are two splitfuls of Turkey gauze of three threads in the split. These two splitfuls being separated by one empty split, or otherwise, three shots of weft or fur are uncut, and six shots cut in the centre; the figure exhibits the effect which the crossing of the warp-threads have upon the fur, in causing both sides of the weft, when cut, to incline towards each other, leaving the warp-threads to serve as back-bone or back-band to the lateral threads or fibres.

Fig. 2nd exhibits two crossing-threads turning round a cord or dead-thread, which is accomplished with bead-lams, a term known among weavers, and which the figure explains. This figure also exhibits, in some degree, the appearance the fur has when woven, and the effect the crossing produces after it has been cut.

The pattern intended to be produced is drawn or copied on design paper, formed with as many horizontal lines as we intend there shall be shots of the prepared fur-weft, previously described, in the fabric to be afterwards made; after these lines of the design paper are cut asunder into stripes and numbered. The weaver then enters one of these lines, beginning with No. 1, through the reed of the loom, and commences to weave the colours of weft, in the exact order in which the colours are painted on those pieces of paper. As some patterns are very extensive, the cloth requires to be cut into pieces; therefore to guide the weaver in the operation of weaving the prepared fur, we number the pieces as follows.

At the beginning of each piece, the workman works on the number, by throwing in a shot or shots of white weft on a black ground, to denote the units; blue weft for five; red weft for ten; and yellow for fifty; and so on.

The number of the pattern is woven with different colours, in a similar manner ; by these means it is always easy to ascertain to what pattern, and to what part of a pattern each piece of fur-weft belongs. As a number of the stripes of the fur are woven in each breadth of the web, each stripe of fur will be a repeat of the pattern or figure intended ; therefore, when we wish to make ten rugs, or articles of a full pattern, we have ten stripes of the fur in the breadth of the fur-loom. In cutting into stripes the wove fur we use scissors, worked with hand, or the usual spiral cutting machine, or a horizontal cylinder, with circular knives set at suitable distances on it, the knives being divided by washers of wood or metal. In the middle of the washer is a groove, in which the back bone of the fur-stripe lies, and guides it while passing over the cylinder, and between the knives which are cutting the wove fur into stripes. Before the wove fur comes to the cylinder, we have also a guide made of wooden or metal roller, with grooves to receive the back bone of the fur at same distances as the groove in the washer, this roller guiding the fur on to the knives ; and also after the fur has passed over the cylinder, and is cut by the knives, which, with the cylinder, are made to revolve rapidly on a centre, the fur being made to pass over with a counter movement, but much slower. We have another roller with grooves rather deeper, which assist in bringing up the lateral fibres on each side of the cut stripes, closely toward each other. We also, particularly in cases where the fur is short, make the stripes of fur to pass over one or more additional rollers, which revolve in troughs containing dissolved gum or other glutinous matter, and as the roller takes up part of the gum and imparts it to the back-bone of the fur, this, when dry, serves to bind it securely. The stripes of fur are next re-woven on the surface of any suitable ground-work. The web or ground-warp is prepared with an extra warp, which may be termed the catcher-warp. A shade is formed of both

warps for the ground shot, and a shade of the catcher-warp only is made to receive the fur-stripe or weft, there being fewer threads of the catcher-warp than the ground-warps; less resistance is thereby offered in bringing the fur of the weft to the surface. In some cases we use a portion of the ground-warp itself, for fixing the fur upon the surface, using as many of the ground-warp threads as may be deemed necessary for the purpose. The weaver having thrown in a shot of the fur, sets it in its proper place with his hand or otherwise, and then with a brush or comb or other instrument, raises all the fibres of the fur from the catcher-warp, on that part of the ground-warp which is to fix it on the fabric, and drives it firmly up with the lay or other instrument. We then proceed to throw in as many ground-shots as are deemed necessary to form the ground below, repeating the operation of setting or weaving in the fur, with the necessary number of shots to form the ground, the fur being set at such distances, as may have been calculated on for the purpose. These operations are done by the heddles or mountings, commonly used in weaving looms.

And having now particularly described the nature of our said invention, and the manner in which the same is to be performed, we declare, with reference to the mode of weaving hereinbefore described, that we do not claim as new the machinery or looms with which the fabrics are produced; nor do we claim as new the systematic arrangement of colours, and weaving them on a gauze, and cutting the said web up into stripes, and re-weaving the threads turned or unturned, on being so cut up on another warp, so as to form a regular pattern. We declare, also, that we do not claim the invention of the circular cutting-machine, hereinbefore described; but that we have mentioned it as what we deem the best among the various modes of dividing or cutting the fur-weft into stripes which may be adopted.

And we declare that what we claim as new or im-

proved, and of our invention, is the mode hereinbefore described, of producing or preparing stripes of silk, cotton, woollen or linen, or of a mixture of any two or more of these materials, in such manner that the west or lateral fibres of both cut edges of each stripe are all brought up on one side, and into close compact with each other, and the re-weaving of such stripes with the whole fur or pile uppermost, into the surfaces of carpets, rugs, shawls, or other similar articles, at the same time that a ground-work or platform is woven for the same.—In witness whereof, &c.

JAMES TEMPLETON.

WILLIAM QUIGLAY.

Enrolled January 25, 1840.

ALTERATIONS AND DISCLAIMERS IN SPECIFICATIONS.

In the Matter of a Patent granted to JAMES TEMPLETON, Manufacturer, in Paisley, and WILLIAM QUIGLAY, Weaver, in Paisley, for their Invention of Machinery for a New and Improved Mode of Manufacturing Silk, Cotton, Woollen, and Linen Fabrics.—
Sealed July 25, 1839.

Memorandum of alteration of the title of the said patent,
entered by JAMES TEMPLETON and WILLIAM QUIGLAY.

We, the said James Templeton and William Quiglay, are advised, and believe, that we cannot specify our invention under the title of our said patent, we therefore alter the title, from “machinery for a new and improved mode of manufacturing silk, cotton, woollen, and linen fabrics,” to “an improved mode of manufacturing silk, cotton, woollen, and linen fabrics.”—In witness whereof, &c.

JAMES TEMPLETON.

WILLIAM QUIGLAY.

Enrolled December 13, 1839.

LAW REPORTS OF PATENT CASES.

*In the Rolls Court.**Before Lord LANGDALE.*WILSON AND OTHERS *v.* TINDALL.*(Continued from page 248.)*

Mr. Turner.—My lord, I appear in this case for Mr. Tindall. I apprehend that to entitle the plaintiff to this injunction, there are three points which he must establish; first, he must shew that he has a legal title; secondly, he must be the user; and, thirdly, he must shew that the defendant has been guilty of an infringement of the patent. The plaintiff claims before your lordship the exclusive right of manufacturing cocoa-nut candles, and, as a consequence, I apprehend, also, the exclusive right of manufacturing that oil which is extracted from the substance called cocoa-nut oil. My lord, he claims that right, and says that this court will give him an injunction to maintain that right, without the matter ever being put in the course of trial at law. Now, my lord, the plaintiff having to establish these points, the legal right, user, and infringement,—let us see what it is his specification professes his invention to be; he describes it as a new preparation or manufacture of a certain material produced from a vegetable substance, and the application thereof to the purposes of affording light and other uses; and, my lord, what is claimed by the patent, is, the application of a particular process to the extraction from cocoa-nut oil of stearine and lamp-oil. He says his invention consists in preparing or manufacturing the material or substance commonly called cocoa-nut by subjecting it to the process of hydraulic or other suitable pressure, by which he separates the elaine from the stearine. So that, there never before having been an application of hydraulic pressure to cocoa-nut oil for the purposes of separating the stearine from the elaine, he claims the exclusive right to apply such pressure in such

manufacture. Now, my lord, in looking at this specification, your lordship will observe the particular mode in which it is expressed. It assumes that it was a well-known fact, that cocoa-nut oil did contain the two materials of stearine and elaine. It was a well-known fact, whether known particularly as to cocoa-nut oil I do not say, except, that I say it appears by this patent to have been a well-known fact, that in the other vegetable matters the other oils which are described there, were contained the two matters, the elaine and the stearine; that, in point of fact those substances were upon the same footing with animal fat, which consists also of two substances, the stearine and elaine. Now, my lord, in the *Repertory of Arts* for 1816, there is a treatise by Mr. Braconnot on the subject of fatty matters; it goes through a great variety of them; and by that treatise it appears that all those substances consist of those several matters, stearine and elaine; and, amongst others, some vegetable substances are there described, as consisting of those several parts. Therefore, I think your lordship must assume that, long before the granting of this patent, it was known that cocoa-nut oil consisted of the two substances of elaine and stearine; and was it not known, before the granting of this patent, that a separation of the stearine from the elaine could be effected by means of pressure? Why, my lord, in 1817, there was published, by Dr. Thomson, a book entitled "*System of Chemistry*;" and in that book he treats of this subject of stearine, and he describes the method by which the stearine and elaine were separated. He says, "the method pursued by Braconnot was very simple, and seems to shew that in fixed oily bodies the stearine and the elaine are not in chemical combination mixed with each other. If the oil to be examined was liquid he exposed it to the cold till congealed. In this congealed state it was subjected to strong pressure between folds of blotting paper, the elaine was imbibed by the paper, and the stearine remained behind in a solid state.

If the oil to be examined was already solid, it was not necessary to expose it to cold, it was simply subjected to pressure between folds of blotting-paper." Therefore, my lord, in the year 1817, the practice of extracting oil, and separating the elaine from the stearine in fatty substances, was a well known existing practice.

Lord Langdale.—A great deal more than that Mr. Sturge says of sperm-oil. That is stronger than Dr. Thomson's book. You are now trying to fix it upon cocoa-nut oil.

Mr. Turner.—Yes, my lord ; I fix it upon the cocoa-nut by the expression contained in this patent, in which he describes it as consisting of elaine and stearine.

Lord Langdale.—That is after he has found it out.

Mr. Turner.—He does not claim any merit for the discovery ; he does not say that he has discovered it ;—he speaks of it as a well-known fact. And the patent is merely for applying the same pressure to the substance called cocoa-nut oil, to produce the same result, by that application, as has before been produced by the application of it to similar purposes. I submit to your lordship, therefore, that in point of law this patent would be bad ; and I think it is going a little too far to ask this court to assume it to be good, and to grant an injunction which shall put out of question the trial, whether or not it is good or bad. Now, my lord, with reference to the second point which I have submitted to your lordship, which is the question of user ; it will be necessary to call your lordship's attention a little to what, in point of fact, is the mode which is pointed out by this patent, and what, in point, of fact is the mode which is practised by these parties, as it appears upon our affidavits. Now, my lord, the first statement that this gentleman makes in his patent, is, that he takes the cocoa-nut oil in the state in which it is imported into this country, and submits it to a strong hydraulic pressure : according to the course he now pursues, the substance which is imported

into this country undergoes another process before it is all subjected to hydraulic pressure. It undergoes the process of being melted by means of steam passed through a tank and iron pipes, in such a manner as for the steam not to escape through the tank ; so that according to the patent there is one process described, and according to the course pursued by him there is an intermediate process coming into operation, before the process described in the specification is to take effect. Then he goes on to describe the material of which the wrappers are formed. He says the packages are formed by first wrapping the substances in strong linen cloth of close texture, and then in an outward wrapper of strong sail cloth. In the present process he uses coir-yarn. But, my lord, one extremely material variation, which your lordship will find is this : In his specification he says, "the temperature at which the pressure is began should be from about fifty to fifty-five degrees, or in summer as nearly at this range as can be obtained, and the packages of the substance intended for pressure, should be exposed for several hours previously, to about the same temperature." Now, the present mode is this:—"The mats with their contents are then subjected to a pressure at a temperature of from fifty-eight to sixty-one degrees, for a period of about twenty-four hours." Now, the whole value of this process consists in the degree of temperature at which it is applied. We find here a variation of no less than eight degrees in the temperature between the mode described in the specification, and that which is pursued at the present time. And not only that, my lord, but, in the present course which is pursued, there are two pressures adopted instead of one. The patent describes one single pressure ; the course now adopted is "after the pressure, the mats with their contents are removed from the first press, and placed in another hydraulic press, at a temperature of from seventy to seventy-one degrees, and subjected again to pressure for a further period of about forty-eight hours."

Now that is as to the stearine ; as to the elaine there are similar differences. In the specification it is stated that he purifies it by an admixture, according to the degree of its apparent foulness, of from one or two per cent., by weight, of the sulphuric-acid of commerce, of about 1.8 specific gravity, diluted with six times its weight of water. Then he says, in the present course the fluid-oil which escapes from the mats, on their being subjected to pressure, was taken from the vessels, into which it had been received from the presses, and placed in a large vat with a quantity of sulphuric-acid in water. Then the mode of agitating is varied ; for he says in the old mode, that he preferred the use of a vessel like a common barrel-churn: the present mode is by boiling the oil by passing hot steam into the vat. Then, there is a process adopted of pouring fresh water into it without acid, and then boiling it up a second time, about which nothing at all appears in the specification. I submit, therefore, that the course which these parties now pursue for the manufacture of this article, is altogether different from that which is described in the specification. My learned friend says, that the variations I have read are merely improvements upon the old proceeding prescribed by the patent, and that the improvements will not vitiate the patent. Whether that be so or not, I apprehend that it will bear very materially upon the question of the mode in which the court will deal with the case. My lord, as the matter stands upon the affidavits, there is no infringement of this patent proved on the part of the defendant. My learned friend, I think, felt the difficulty of that part of the case, from the argument which he adopted, by saying, if the defendant manufactured cocoa-nut candles at all, that is a breach of the patent. My lord, I apprehend that upon the construction of the patent, the manufacture of cocoa-nut candles has nothing to do with the case ;—the question is, what is the process adopted for extracting the stearine and the elaine from the cocoa-nut oil ? We

have sworn distinctly that we do not adopt that process which is described in the plaintiff's patent. My lord, observations have been made by my learned friend, with reference to the affidavit of the defendant. My learned friend seemed to consider that there had either been some delusion on the part of the defendant, or some intention to misrepresent the case on the part of the defendant, in stating that the average degree of temperature, at which the pressure is commenced by him in his process, is never so low as the highest temperature described in the specification. My learned friend said that the average degree of temperature included the pressure of the original copperah into cocoa-nut oil, and that a high degree of temperature was necessary for that purpose, and that, therefore, the average pressure was increased. My lord, I think upon a fair reading of this affidavit, no such inference can be deduced from it. He says, "he admits that he subjects to compression in hydraulic presses, a material prepared by himself from the cocoa-nut called copperah." It is quite clear that it is a material prepared by him from the cocoa-nut, called copperah, that he subjects to pressure. Then he says, except in the use of the hydraulic press, he does not, and never has, followed any processes described in the specification of the patent of James Soames. It must be evident to your lordship, that the process which he does adopt is a different process from that which is described in the specification; because the lowest degree of temperature that he uses, is higher than the highest temperature described in the patent. I therefore submit, in the first place, that there is no case made out upon the affidavits, of legal title and of user; and, further, that there is no case of infringement.

Mr. Wigram followed on the same side.

JUDGEMENT.

Lord Langdale.—Having regard to the arguments on the validity of the patent, to the enjoyment of it by the

plaintiffs, and to the evidence which appears upon the affidavits which have been made in this case, I am of opinion, that the injunction which is applied for ought to be granted.

The question for consideration is, whether any terms ought to be imposed upon the plaintiffs, or whether any other mode of investigating the facts than that which is adopted in the usual course of proceeding in this court, ought to be adopted. It is to be observed, that all orders made on applications of this kind, are merely interlocutory orders. They do not bind the right between the parties. The injunction which I have stated it to be my intention to grant, will be an injunction, of course, only till further order. It will not be a perpetual injunction, not an injunction to continue during the continuance of the patent. Notwithstanding this order, the defendant may put in his answer, and by putting in his answer, he may displace all the affidavits which have been filed on both sides. The plaintiff and the defendant may respectively proceed to evidence, they may bring this cause on for a hearing, and upon the hearing of the cause, the whole case, the law regarding the patent, and the facts which will appear upon the depositions, will have to be re-considered, and that re-consideration may, for anything that can be known to the contrary, justly end in a result different from that which I have come to upon the present occasion.

The defendant having his option to adopt this course of proceedings, has at the bar expressed his desire to have this matter tried at law. If he were left merely to prosecute a *scire facias* for the repeal of the patent, that would be one part of the question, which he might in that way try; but there are other questions subsisting between the parties, regarding matters of fact, which could not be tried in that way.

Now it has been stated by Lord Cottenham, that he recollected no instance in which the court has not adopted the course of directing the trial of an action. As he has

stated that to be the results of his experience, I certainly am very reluctant to try my own memory against that ; but I should have supposed that there were instances in which that had been done. It is not the right of parties in every case to have an action tried in a court of law. It is a question of convenience, and the court is to exercise a fair discretion. I have no doubt, whatever, of the competency of this court to grant an injunction *simpliciter*. Neither had Lord Cottenham any doubt of it. But the question is, whether when there is an opportunity for carrying the matter further, it is not, on the whole, a convenient course of proceedings to have it tried before the tribunal which is most proper for the determination of the legal question, and by which the facts can be better investigated than they can here. It is not, therefore, upon the ground of any doubt as to the validity of the patent, that I make the order which I am about to make ; but it is because the nature of the case entitles the defendant to a further investigation in one form or other ; and the most convenient and most effective mode appears to me to be that which has been mentioned, namely, by bringing an action in a court of law. Notwithstanding, therefore, the very forcible arguments I have heard upon this subject, I think I must, in this case, as has been done in so many other cases, direct the plaintiff to bring an action to try this right, the injunction being granted in the terms of the notice of motion.

Mr. Turner.—With respect to the terms in which the injunction is applied for, it has been suggested whether they might not interfere with our right to make cocoa-nut oil from copperah.

Lord Langdale.—Mr. Wigram expressed some apprehension that those terms might interfere with the defendant's right to make cocoa-nut oil from copperah. That would be quite contrary to the intention of the court.

Mr. Turner.—The terms are, “using or exercising,

either by himself or by his agents or servants, the invention or discovery, in the complainant's bill mentioned, of a new preparation or manufacture of a certain material produced from a vegetable substance." That is the title of the patent. The specification confines it to cocoa-nut oil. Therefore, I apprehend, that the terms of the injunction would be to restrain us from using "the invention or discovery in the specification of the patent in the plaintiff's bill mentioned."

Mr. Pemberton.—It would answer every purpose to have it "from making or vending the substances called stearine and elaine, produced by means of the said invention from cocoa-nut oil."

Mr. Turner.—That would remove also the objection I have to the latter part of this,—“or any candles manufactured from, or compounded of the said substance called stearine.” It must be stearine produced from cocoa-nut oil. Then the early part will be omitted, and the injunction will be—“from making or vending the substances called stearine and elaine from cocoa-nut oil, by means of the said invention,”—Leaving out those other words.

Mr. Pemberton.—“Or any candles manufactured from or compounded of stearine produced from cocoa-nut oil.” It will be necessary, in consequence of the course your lordship has thought fit to adopt, that there should be some directions with respect to the trial, to prevent the necessity of proving points not in controversy. For instance, they would admit the plaintiff's patent and the assignment.

Lord Langdale.—Those things they must admit of course.

Mr. Pemberton.—And they must also either do what was done in another case; that is, permit a witness to see their mode of manufacture, or they must—

Lord Langdale.—The object of the trial is, that the facts shall be really brought forward.

Mr. Turner.—If we admit them to see our process,—if

it turns out that our process is different from theirs,—the effect of that is, to disclose to the world our own process. Now they come here upon affidavits, and they represent that they are in a situation to prove these facts, without any access to our works. They say they have seen our works. But it is a monstrous piece of injustice, that when the court sends it for trial, the defendant shall be obliged to disclose his process to the world.

Mr. Pemberton.—Your lordship has already said, that that which is to be tried is that which appears to be in controversy.

Lord Langdale (to Mr. Turner).—You must admit what is sufficient to enable them to bring an action against you upon the point.

Mr. Wigram.—Supposing we were to admit, for the purposes of the action, that we made it in the same mode as the plaintiff at present uses.

Mr. Pemberton.—That will do.

Lord Langdale.—I will not put them upon the terms of bringing an action, unless I can put you upon the terms of giving them the means of doing so.

Mr. Pemberton.—We are quite willing to take that. That will answer every purpose. What I should submit would be, that the proper admission would be, that they have made and sold cocoa-nut candles, manufactured from stearine produced from cocoa-nut oil by the process we have used.

Lord Langdale.—That is quite right, certainly.

Mr. Turner.—If they will furnish us with the admissions they propose, we should like to consider them.

Lord Langdale.—You may have an opportunity of considering them; but I cannot put them upon the terms of bringing an action without putting you upon such terms as will enable them to do it with effect.

Mr. Turner.—If they will hand over to us the admissions they propose, we will consult the Common Law Counsel upon them.

Lord Langdale.—That I think will be the better way.

Mr. Turner.—Your lordship will require them to go to trial immediately.

Lord Langdale.—They will have an opportunity of consulting their advocates at law, to know how soon they can conveniently do it, and then let the other subject be mentioned also.

Mr. Turner.—Perhaps they will hand us the admissions immediately, and then it may be tried at these sittings.

Mr. Pemberton —I will hand them to you directly. My learned friends may consider the precise terms afterwards ; but what I would propose, is this, that the injunction be granted according to the notice as altered, the plaintiff's undertaking to bring an action against the defendant for an infringement of the patent, in which action the defendant is to admit the due assignment of the patent to the plaintiff's at the time stated in the bill, and the fact that the defendant has manufactured stearine from cocoa-nut oil by the same process as the plaintiff has used the last five years, and has manufactured and sold cocoa-nut oil candles from such stearine.

Mr. Turner.—With respect to the time of the injunction ?

Mr. Pemberton.—Of course it will be till further order.

Lord Langdale.—Till further order ; if you accede to those terms, you had better give notice to the other side immediately, that they may proceed, and if not, you may mention it again to the court.

Mr. Pemberton.—It may be necessary, perhaps, for both of us to submit them to common law counsel.

Mr. Turner.—Where will you bring the action ?

Mr. Pemberton.—We shall bring it in the Common Pleas.

Lord Langdale.—You will get it tried much sooner in that way.

Mr. Pemberton.—My Lord, I do not think that there is anything more that we can do here.

Mr. Turner.—We will mention it again at the Seal.

Lord Langdale.—You may mention it when you please.

Mr. Turner.—If we accede to the terms you propose, it may be tried at the present sittings.

Mr. Pemberton.—It cannot be tried at the present sittings.

SCIENTIFIC MISCELLANEA.

PROGRESS OF FOREIGN SCIENCE.

Oil-Bearing Plants.

An extensive and accurate set of experiments have been made by Boussingault, upon the economics of cultivation of the "*Madia sativa*," a new oil-producing plant, whose growth is beginning to be successfully introduced into France.

This plant is a spring crop, and said to be much more valuable, considering its produce and cost of culture, than colza, or other analogous crops.

The cost of culture per hectare, as compared with beetroot and potatoes, is given as follows:—

	francs.	cents.
Beetroot.....	172	80
Potatoes.....	162	35
<i>Madia</i>	175	20

In this case the *madia* was cultivated along with carrot. The *madia* is a plant of the natural order *Hælianthæ*, and a native of Chili. There is, therefore, every probability that it would succeed as a crop in the Southern counties of England. It hence is worthy the attention of the British agriculturists.

Composition of the Atmosphere.

In pursuit of the investigation, by new methods, of the constitution of our atmosphere, by M. Dumas and his compeers, who have undertaken to make contemporaneous analyses of the air at various distant points of the world, a novel fact has already been elicited, which, if ultimately sustained, will be of great scientific importance. M. Lévy, who has gone to Copenhagen to make analyses there, has found that the constitution of the air over the sea at some distance from land, is sensibly different from that on shore; that in fact, it contains less oxygen at sea than on land, in the proportion

about 2257 to 2300. The difference must be presumed to be owing to an endiometric action of the surface water of the sea, by which it absorbs a portion of oxygen from the mixture constituting our atmosphere.

Navigation of the Rhone.

A grand engineering project, similar in its principles to that which has been executed a year or two upon the Upper Bann, in the North of Ireland, but upon an immensely greater scale, has been projected and brought forward by M. Vallée. The Rhone, for about three months in the year, ceases to be navigable for a great length, in spring and autumn, from want of water.

It is proposed to raise the level of the lake of Geneva by sluices or moveable weirs (on the American system) to deepen the bed of the river, and to make certain necessary embankments. The lakes of Bourget and of Annecy are also proposed to be formed into reservoirs; and it is calculated that a rise of only three decimetres in the lake of Geneva will impound *a milliard of cubic metres of water*, which would give a supply during the dry season of 255 cubic metres per second, at the minimum.

The cost of the work is estimated at three millions and a half (of francs it is presumed). This is certainly a case of engineering on the grand scale. This method of equalizing the currents of rivers is, however, by no means new, although very little acted on in modern times. The Nile of old was thus regulated, or partially regulated, by the lake Mæris.

Organic Chemistry.

All who know anything of this branch of chemical science are aware that the present greatest difficulty of ultimate organic analyses consists in the determination of nitrogen, where it exists in the body analyzed; for while we collect and weigh the carbon and hydrogen by Leibig's beautiful apparatus, we collect the nitrogen and measure its volume, subject to all the usual corrections, and uncertain as to its purity. Berzelius has lately proposed, in a letter to Plantamour, to reduce the nitrogen all to ammonia by caustic potass, to receive it in dilute hydrochloric acid, to precipitate by chloride of platina, and to weigh in the state of ammoniacal chloride of platina, or, having ignited, to weigh the reduced metal and calculate the nitrogen therefrom. The method has been tried with success upon the cyanogen compounds by these chemists, who recommend it as a valuable means of controul in determinations of nitrogen. It has since been used by various foreign and British chemists also with advantage.

NOTICE OF EXPIRED PATENTS.

THOMAS HILLMAN, of Millwall, Poplar, in the county of Middlesex, Mast Maker, for improvements in the construction and fastening of made masts.—Sealed May 1, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 595.*)

JONATHAN BROWNILL, of Sheffield, in the county of York, Cutler, for an improved method of transferring vessels from a higher to a lower level, or from a lower to a higher level, on canals, and also for the more conveniently raising or lowering of weights, carriages, or goods on railroads, and for other purposes.—Sealed May 1, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 466.*)

JAMES PALMER, of Globe Road, Mile End, in the county of Middlesex, Paper Maker, for improvements in the moulds, machinery, or apparatus, for making paper.—Sealed May 6, 1828.

THOMAS ADAMS, of Oldbury, in the county of Salop, Manufacturer, for improvements on instruments, trusses or apparatus, for the relief or cure of hernia or rupture.—Sealed May 6, 1828.

FRANCIS WESTLY, of Leicester, Cutler, for certain improved apparatus to be used for the purpose of whetting or sharpening the edges of blades of knives, or other cutting instruments.—Sealed May 6, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 532.*)

SAMUEL BROOKING, of Plymouth, in the county of Devon, Rear Admiral in the Royal Navy, for a certain turning, or shipping fid, for securing and releasing the upper masts of ships and vessels.—Sealed May 6, 1828.

MATTHEW FULLWOOD, Junior, of Stratford, in the county of Essex, Gentleman, for cement, mastic, or composition, which he intends to denominate German Cement.—Sealed May 6, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 479.*)

JOHN BENJAMIN MACNEIL, of Poleshill, Coventry, Engineer, for improvements in preparing and applying materials for the making, constructing, or rendering more durable, roads and other ways, which materials so prepared are applicable to other purposes.—Sealed May 6, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 407.*)

THOMAS JACKSON, of Red Lion Street, Holborn, in the county of Middlesex, Watch Maker, for a new metal stud to be applied to boots, shoes, and other like articles of manufacture.—Sealed May 13, 1828.

JOHN FORD, of Wandsworth Road, Vauxhall, in the county of

Surrey, Machine Maker, for improvements in machinery for clearing, opening, scribbling, carding, combing, slubbing, and spinning wool, and for carding, roving, or shivering and spinning cotton, short stapled flax, hemp, and silk, either separately or combined, and for spinning or twisting long-stapled flax, hemp, silk, mohair, or other fibrous substances, either separately or combined.—Sealed May 13 1828.

THOMAS BONSOR CROMPTON, of Farnworth, in the county of Lancaster, Paper Maker, and ENOCH TAYLOR, of Marsden, in Yorkshire, Mill Wright, for improvements in that part of the process of paper-making which relates to the cutting.—Sealed May 13, 1828.—(*For copy of specification, see Repertory, Vol 8, third series, p. 654.*)

CHARLES CHUBB, of St. Paul's Church Yard, in the city of London, Patent Lock Manufacturer, for improvements in the construction of latches which may be used for fastening doors or gates.—Sealed May 17, 1828.—(*For copy of specification, see Repertory, Vol. 8, third series. p. 321.*)

THOMAS WILLIAM, and JOHN POWELL, of the city of Bristol, Glass Merchants and Stone Ware Manufacturers, for improvements in the process, machinery, or apparatus for forming, making, or producing moulds or vessels for refining sugar, and in the application of materials hitherto unused in making the said moulds.—Sealed May 17, 1828.

THOMAS ASPINWALL, of Bishopsgate Church Yard, in the city of London, Esquire, for an improved method of casting printing types, by means of a mechanical process, which invention he proposes to call the Mechanical Type Castor. Communicated by a foreigner residing abroad.—Sealed May 22, 1828.

SAMUEL HALL, of Basford, in the county of Nottingham, Cotton Manufacturer, for a method and an apparatus for generating steam, and various gasses to produce motive power, and for other useful purposes.—Sealed May 31, 1828.

PATENTS GRANTED FOR SCOTLAND,

From February 23, to March 16, 1842.

WILLIAM BAER, of Grosvenor Street, Grosvenor Square, in the county of Middlesex, Surgeon, for certain improvements in the manufacture of boots and shoes.—Sealed February 23, 1842.

GEORGE HADEN, of Trowbridge, in the county of Wilts, Engineer, for certain improvements in apparatus for

warming and ventilating buildings.—Sealed February 23, 1842.

JOSEPH HENRY TUCK, of the New North Road, Hoxton, in the county of Middlesex, Engineer, for improvements in apparatus or machinery for making or manufacturing candles.—Sealed February 25, 1842.

HUGH LEE PATTINSON, of Bensham Grove, Gateshead, in the county of Durham, Manufacturing Chemist, for improvements in the manufacture of white lead, part of which improvements are applicable to the manufacture of magnesia and its salts.—Sealed February 25, 1842.

MATTHEW ALLEN, of High Beech, in the county of Essex, Doctor in Medicine, for an improvement in producing uneven surfaces on wood. Communicated by a foreigner residing abroad.—Sealed March 2, 1842.

STROPFORD THOMAS JONES, of Stafford Place, Pimlico, in the county of Middlesex, Gentleman, for certain improvements in machinery for propelling vessels by steam or other power.—Sealed March 2, 1842.

JOSEPH DREW, the younger, of Saint Peter's Port, in the Island of Guernsey, Confectioner, for an improved method of rolling and cutting lozenges, and also of cutting gun wads and other similar substances, by means of a certain machine designed by him, and constructed of divers metals and wood.—Sealed March 7, 1842.

JOSEPH GARNET, of Haslingden, in the county of Lancaster, Dyer, and **JOHN MASON**, of Rochdale in the same county, Machine Maker, for certain improvements in machinery or apparatus employed in the manufacture of yarns and cloth, and are also in possession of certain improvements applicable to the same. Communicated by a foreigner residing abroad.—Sealed March 8, 1842.

GEORGE JARMAN, of Leeds, in the county of York, Flax and Cotton Spinner; **ROBERT COOK**, of Hathersage, in the county of Derby, Heckle and Needle Manufacturer; and **JOSHUA WORDSWORTH**, of Leeds, aforesaid, Machine Maker, for certain improvements in machinery for spinning flax, hemp, and tow.—Sealed March 9, 1842.

JAMES IONS, of Newcastle-upon-Tyne, Gentleman, for improvements in smelting copper ores.—Sealed March 10, 1842.

JULIUS BORDIER, of Austin Friars, in the City of London, Merchant, for certain improvements in preparing skins and hides, and converting them into leather. Communicated by a foreigner residing abroad.—Sealed March 11, 1842.

RICHARD LAWRENCE STURTEVANT, of No. 42, Church Street, Bethnal Green, in the county of Middlesex, Soap Manufacturer, for certain improvements in the manufacture of soap.—Sealed March 14, 1842.

WILLIAM HICKLING BURNETT, of Ravensbourne Wood Mills, Deptford Creek, in the county of Kent, Gentleman, for improvements in machinery for cutting wood, and in apparatus connected therewith, part of which may be applied to other purposes.—Sealed March 14, 1842.

GEORGE WILDES, of Coleman Street, in the City of London, Merchant, for improvements in the manufacture of white-lead. Communicated by a foreigner residing abroad.—Sealed March 16, 1842.

LIST OF NEW PATENTS.

JOSEPH CLISILD DANIELL, of Twerton Mills, Bath, for improvements in making and preparing food for cattle.—Sealed March 31, 1842.—(*Six months.*)

JULIUS SEYBEL, of Golden Square, Middlesex, Chemist, for improvements in the manufacture of sulphate of soda and chlorine.—Sealed March 31, 1842.—(*Six months.*)

WILLIAM LIVERSIDGE TRIPPETT, of Charlton-upon-Medlock, Lancaster, Agent, for improvements in looms for weaving by hand or by power.—Sealed March 31, 1842.—(*Six months.*)

JOHN BEVAN, of Whitehead's Grove, Chelsea, Gentleman, for an improved mode of expelling the air from certain cases, or vessels, used for the preservation of various articles of food.—Sealed April 6, 1842.—(*Six months.*)

JAMES SMITH, of Deanstone Works, Perth, Cotton Spinner ; and JAMES BUCHANAN, of the City of Glasgow, Merchant, for certain improvements applicable to the preparing and spinning of cotton, wool, flax, hemp, and other fibrous substances.—Sealed April 6, 1842.—(*Six months.*)

JOHN READ, of Regent's Circus, Machanist ; HENRY PURLAND, of Hurst Green, Sussex, Farmer ; and CHARLES WOODS, of Fore Street, Cripplegate, Commercial Traveller, for improvements in the construction and make of driving reins, harness, bridles, and reins, and in bridles and reins for riding.—Sealed April 6, 1842.—(*Six months.*)

JEAN GEORGE SUE CLARKE, of Euston Grove, Engineer, for improvements in supplying and regulating air to the furnaces of locomotive engines. Communicated by a foreigner residing abroad.—Sealed April 6, 1842.—(*Six months.*)

THOMAS CLIVE, of Birmingham, Iron Founder, for certain improvements in the construction of candlesticks.—Sealed April 7, 1842.—(*Six months.*)

JOHN ANTHONY TIELENS, of Fenchurch Street, Merchant, for improvements in machinery or apparatus for knitting. Communicated by a foreigner residing abroad.—Sealed April 7, 1842.—(*Six months.*)

MARC CARLOTTI, of Little Argyll Street, Regent Street, for certain improvements in the construction and manufacture of boots, half-boots, shoes, clogs, and galoshes. Communicated by a foreigner residing abroad.—Sealed April 8, 1842.—(*Six months.*)

WILLIAM FALCONER, of Clapham Common, Surrey, Gentleman, for improvements in apparatus for attaching buttons and fasteners to gloves and parts of garments.—Sealed April 13, 1842.—(*Six months.*)

JOHN BYRON DAWES, of Trafalgar Square, Charing Cross, Gentleman, for a certain improved chemical composition to be employed in the preparation of glass, or other media of light.—Sealed April 15, 1842.—(*Six months.*)

JOHN LAMB, of Kiddderminster, Machinist, for improvements in engines to be worked by steam, air, gas, or vapours, which improvements are also applicable to pumps for raising or forcing water, air, or other fluids.—Sealed April 15, 1842.—(*Six months.*)

THOMAS RICHARDS, of Liverpool, Bookbinder, for certain improvements in the art of bookbinding, and also in machinery or apparatus to be employed therein.—Sealed April 15, 1842.—(*Six months.*)

ALFRED JEFFERY, of Lloyd's Street, Pentonville, Gentleman, for a new method of preparing masts, spars, and other wood, for ship-building and other purposes.—Sealed April 15, 1842.—(*Six months.*)

CHARLES FARINA, of Leicester Square, Chemist, for a new method of manufacturing soap, candles, and sealing-wax.—Sealed April 15, 1842.—(*Six months.*)

KENT KINGDON, of Exeter, Cabinet Maker, for certain improvements in impressing and embossing patterns on silk, cotton, and other woven or felted fabrics.—Sealed April 21, 1842.—(*Six months*)

WILLIAM NOEL, of Jermyn Street, Saint James's, Boot and Shoe Maker, for certain improvements in the manufacture of boots and shoes.—Sealed April 21, 1842.—(*Six months.*)

ALPHONSE DE TROISBRIOUX, of Great Russell Street, Bloomsbury, Gentleman, for improvements in lithographic and other printing-presses. Communicated by a foreigner residing abroad.—Sealed April 21, 1842.—(*Six months.*)

OTTO ROTTON, of Gracechurch Street, Doctor of Medicine, for certain improvements in machinery or apparatus for spinning cotton, wool, silk, and other fibrous substances. Communicated by a foreigner residing abroad.—Sealed April 26, 1842.—(*Six months.*)

WILLIAM WOOD, of Wilton, Carpet Manufacturer, for a new mode of weaving carpetting and other figured fabrics.—Sealed April 26, 1842.

SEPTIMUS COCKING, of Birmingham, Draftsman, for certain improvements in the production of light by the burning of oil, tallow, and wax, and in the apparatus for regulating and extinguishing the same. Partly communicated by a foreigner residing abroad.—Sealed April 26, 1842.—(*Six months.*)

RAOUL ARMOND JOSEPH JEAN COMTE DE LA CHARTRÉ, of Leicester Square, **RICHARD TAPPIN CLARIDGE**, of Weymouth Street, Gentleman, and **RICHARD HODGSON**, of Salisbury Street, Strand, Gentleman, for improvements in preparing surfaces of fabrics to be used in covering roofs, floors, and other surfaces. Communicated by a foreigner residing abroad.—Sealed April 26, 1842.—(*Six months.*)

HENRY ROBINSON PALMER, of Great George Street, Westminster, Civil Engineer, for an improvement or improvements in the construction of roofs and other parts of buildings, and also for the application of corrugated plates or sheets of metal to certain purposes, for which such sheets or plates have not hitherto been used.—Sealed April 26, 1842.—(*Six months.*)

JOSEPH MÉGE, of Keppel Street, Russell Square, Merchant, for improvements in the making or constructing trowsers. Communicated by a foreigner residing abroad.—Sealed April 26, 1842.—(*Six months.*)

JOHN HENRY PAPE, of Grosvenor Street, Bond Street, Piano-Forte Maker, for improvements in carriages, and in the construction of wheels.—Sealed April 28, 1842.—(*Six months.*)

WILLIAM LOSH, of Newcastle-on-Tyne, Esquire, for improvements in the construction of wheels for carriages and locomotive-engines intended to be employed on railways.—Sealed April 28, 1842.—(*Six months.*)

JOHN VARLEY, of Colne, Lancaster, Engineer, and **EDMONDSON VARLEY**, of the same place, Cotton Manufacturer, for certain improvements in steam-engines.—Sealed April 28, 1842.—(*Six months.*)

THE
REPERTORY
OF
PATENT INVENTIONS.

No. CII. NEW SERIES. — JUNE, 1842.

Specification of the Patent granted to JOSEPH MAUDSLAY, of Lambeth, Engineer, for an Improvement in the Arrangement and Combination of certain parts of Steam-Engines, to be used for Steam Navigation.
—Sealed March 16, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—
My said improvement relates to the arrangement and combination of certain parts of steam-engines of that kind or class, whereof the centre of the steam-cylinder (wherein the piston works) is situated immediately beneath the rotative-axis of the crank or cranks, and which axis is to be turned round by the force exerted by the said piston, when it is moved alternately up and down by action of the steam in its said cylinder, that force being transmitted to the crank-pin of the crank or cranks, by means of a crank-rod or connecting-rod, which acts alternately upwards and downwards, so as to urge that crank-pin round in its intended circular orbit. And as to the particular parts of steam-engines, to the arrangement and combination of which parts my said improvement relates, those parts are, the steam-cylinder with its bottom and cover,

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T T

the piston and piston-rod, the cross-head belonging to the piston-rod and the connecting-rod, together with all requisite appurtenances to those said several parts. And the said several parts above named, when the same are used as some of the constituent parts of steam-engines which are constructed according to my said improvements, are nearly the same as (or are similar to) like parts which have been already used, (or proposed to be used,) some in one kind of steam-engine, and others in other kinds of engines; the said parts already used or proposed to be used as aforesaid, being nearly the same as to their several forms and modes of construction, (when considered as parts detached from the different engines to which they belong,) as the like parts which are to be used in engines constructed according to my improvement. Wherefore my invention does not extend to the individual forms and modes of construction (thereinafter described) of the several parts above named, but my improvement relates solely to the arrangement and combination (hereinafter described) of such parts.

And my said improvement consists in disposing the connecting-rod in a space which is left vacant for its reception, (together with the requisite appurtenances hereinafter enumerated, of that rod,) within the central part of the steam-cylinder, and within the central part of the piston which works up and down in the said cylinder, the steam-cylinder having for that purpose a small cylinder fixed concentrically within it, and the piston being a broad ring or annulus, which encompasses the said small cylinder, and fits into the annular cylindrical space which is left between the interior of the steam-cylinder and the exterior of the said small cylinder. The annular-piston is moved alternately up and down in the said annular-cylindrical space, by the force of steam acting therein, but which steam does not enter into the interior of the small cylinder, neither is any piston or part of the piston fitted therein, but the interior of the small cylinder is left

open at top, the cover of the steam-cylinder being a broad ring or annulus, covering over and closing up the said annular-cylindrical space wherein the annular-piston works, but not covering over the interior of the small cylinder, that interior being a space left open at top and vacant within, for the connecting-rod and its requisite appurtenances to work in with liberty, for that rod to move up and down therein, and likewise with liberty when so moving, to incline as much as it requires to do from a vertical position, alternately on one side of the vertical, and then on the contrary side thereof; in consequence of the upper end of the connecting-rod accompanying the motion of the crank-pin in its circular orbit, in the usual manner of connecting-rods, whilst the lower end of the said rod moves alternately up and down in a vertical-line, that line being at the central-line or imaginary axis of the steam-cylinder, and which axis in ordinary steam-engines is situated in the centre of the solid metal of the ordinary piston and piston-rod, but according to my improvement in the arrangement and combination of the various parts of the said vertical-line or imaginary-axis of the steam-cylinder, is situated in an open space, which, as already stated, is left vacant for the purpose of receiving the connecting-rod together with its appurtenances, within the central part of the cylinder, and within the central part of the annular-piston, in consequence of the small cylinder being fixed concentrically within the interior of the steam-cylinder, and in consequence of the cylinder-cover as well as the piston being each a broad ring or annulus, and each being suitably fitted to the annular-cylindrical space between the two cylinders, without covering or occupying the interior of the small cylinder. And in order to communicate motion from the annular-piston to the joint at the lower end of the connecting-rod, the said annular-piston is provided with two piston-rods, fixed vertically to it at opposite sides of the imaginary centre of

the annular-piston and of the steam-cylinder; those vertical piston-rods being fixed to the annular piston nearly in the middle of its breadth, wherefore they stand nearly in the middle of the breadth of the annular cylindrical space, between the interior of the steam-cylinder and the exterior of the small central cylinder. The said two vertical piston-rods pass up through two stuffing-boxes, which are provided for them in the aforesaid annular cover of the cylinder, and the upper ends of the said two vertical piston rods are firmly united to the two extremities of a strong tee-shaped cross-head, resembling in its form the letter T; the upper part of which extends horizontally across, from the upper end of one piston-rod to that of the other, and which tee-shaped cross-head may be made double, or composed of two parallel sides, or thicknesses put together side by side, so as to be united at the two extremities aforesaid, to which the piston-rods are fastened, but leaving a sufficient opening between the two sides to admit the connecting-rod between them, in order that it may be situated in the middle of the thickness of the tee-shaped cross-head, which is so compounded of two sides fixed together. The vertical stem of each of the said sides of the tee-shaped cross-head goes down at each side of the connecting-rod into the space before mentioned, within the interior of the small cylinder, each of the said vertical stems projecting downwards, from the middle of the horizontal part of the cross-head at right angles thereto, and in one piece of metal therewith, in the form of the upright stem of the letter T; and at the lowermost end of each of the said two stems, the joint-pin for the lower end of the connecting-rod is fixed horizontally across between the two stems; the joint at the lower end of the connecting-rod being fitted on the middle part of the said joint pin, so as to unite the lower end of the connecting-rod to the cross-head, and by means thereof to the piston-rods, and by them to the annular piston; the upper end of the connecting-rod

being jointed, in the usual manner of steam-engines, to the crank-pin. The lower portion of the connecting-rod is situated in the space between the two sides, whereof the tee-shaped cross-head and its vertical stem are compounded, as aforesaid; those two sides being united together at the lowermost ends of the vertical stems by the joint-pin, which is fixed across from one stem to the other, as before mentioned, and the said two thicknesses are also united, as already stated, at the two extremities of the horizontal part to which the piston rods are fastened, wherefore the two sides form, as it were, one compound tee-shaped cross-head, which has a sufficient opening in the middle of its thickness to admit the connecting-rod to work within it, and to admit of that rod inclining as much as it is required to do from a vertical position, alternately on one side of the vertical, and then on the other side thereof. And in order to assist in retaining the joint-pin, at the lower end of the connecting-rod in the vertical line, in which it is intended to move alternately up and down; the lower ends of the two upright stems of the tee-shaped cross-head have sliding pieces fixed to them, which pieces are received between upright grooved straight edges fixed within, or formed within the interior of the small cylinder, so as to constitute a parallel guiding-groove within that interior, for the lower end of the stem of the tee-shaped cross-head to move up and down in, and thereby produce the effect of a parallel motion. The connexion between the annular piston and the joint at the lower end of the connecting-rod, is, therefore, effected by the parts, above described, in the following manner. The two vertical piston-rods ascend from opposite sides of the annulus, and pass up through their two stuffing-boxes in the annular cover. The ends of the horizontal part of the tee-shaped cross-head, *k*, are united with the upper ends of those piston-rods, and the upright stems of the same cross-head, descending into the vacant spaces in the in-

terior of the small cylinder, sustains the joint-pin, for the lower end of the connecting-rod, which pin (according to the length of the upright stems of the tee-shaped cross-head) may be nearly on a level with the annular piston, or may be somewhat higher up or lower down than that level, as may be most convenient ; but, in consequence of the aforesaid mode of connexion, the said pin will be moved up and down in the open space within the interior of the small cylinder, in exact coincidence with the motion wherewith the annular piston is at the same time moved up and down, within the annular cylindrical space between the two cylinders.

And note ; the bottom of the open space, within the interior of the small cylinder may be left open, and a lateral passage may be left beneath the cylinder bottom, for entrance to the said open bottom of the small cylinder, for the convenience of getting at the joint at the lower end of the connecting-rod. And for the more complete explanation of the arrangement and combination of parts already described in words, I have hereunto annexed a drawing of a steam-engine, having its parts arranged and combined according to my said improvement. The said drawing contains all those parts to the arrangement and combination whereof my improvement relates ; but many parts which have no relation to that improvement are omitted in the drawing.

Description of the Drawing.

Fig. 1, is a longitudinal or side elevation of the said engine.

Fig. 2, is a longitudinal vertical section, corresponding to the said elevation, fig. 1.

Fig. 3, is a horizontal plan of the upper part of the engine : and,

Fig. 4, a horizontal section of the cylinders thereof.

Fig. 5, is a transverse vertical elevation and section representing two such engines disposed side by side for

combined action, in the manner engines usually are combined on board steam-vessels; one of the two engines in fig. 5, being represented in section to shew the interior parts, the other being represented in elevation to shew the exterior parts. The same letters of reference denote the same parts in all the figures. *a, a*, is the steam-cylinder, its interior surface being bored truly cylindrical, as usual for steam-cylinders; and *b, b*, is the small cylinder which is fixed concentrically within the steam-cylinder, *a, a*. The external cylindrical surface of the small cylinder is turned true in a lathe, but the interior of the small cylinder does not require boring. *n, n*, is the bottom of the steam-cylinder, to which the flange around the lower part of the steam-cylinder, *a, a*, is fitted, as usual, with a close joint; and the small cylinder, *b, b*, is also fitted to the same bottom with an internal flange at the lower end of the small cylinder, *b, b*, so as to be truly concentric with the interior of the cylinder, *a, a*, in order that an annular cylindrical space may be left between the two cylinders of exactly equal breadth all round. *m, m*, is the cylinder-cover, which is also annular, and adapted to cover over and close up the said annular cylindrical space, without covering over the interior of the small cylinder, *b, b*. The cylinder-cover, *m, m*, is fastened down (as cylinder-covers usually are), by bolts to the exterior flange around the top of the cylinder, *a, a*; and the cover enters into the upper part of the cylinder in the usual manner of cylinder-covers; the annular-cover may be also fastened down by screw-bolts to an external flange around the top of the small cylinder, *b, b*; and the annular-cover drops also over around the top of that small cylinder, so that in fact the cylinder-cover, *m, m*, drops into and fits into the annular cylindrical space between the two cylinders, *a, a*, and *b, b*, and is fastened down by bolts to the exterior flange at the top of the cylinder, *b, b*. *c, c*, is the annular-piston which is fitted into the annular cylindrical space between the two cylinders. The exterior

circumference of the annular-piston, *c, c*, is fitted to the the interior of the steam-cylinder, *a, a*, with packing, either of hemp or metallic packing of any such kind as is commonly used for ordinary pistons. Also the interior circumference of the same annular-piston is fitted to the exterior cylindrical surface of the interior cylinder, *b, b*, with like packing, either of hemp or of metallic packing. *d, d*, are the two piston-rods, which are fixed (by any of the usual modes of fixing a piston-rod to its piston) to the annular-piston at two points therein diametrically opposite one to the other across the centre of the annulus, *c, c*, as is shewn in figs. 2 and 4 ; and the rods, *d, d*, pass up through two stuffing-boxes in the annular-cover, *m, m*, as shewn in fig. 2 ; those stuffing-boxes being constructed to retain packing around the rods in the same manner as stuffing-boxes usually do. The upper ends of the two piston-rods, *d, d*, are securely fastened to the two extremities of the upper horizontal part of the tee-shaped cross-head, *e, e, e, e, f, f*, which, as already mentioned, is compounded of two parallel sides united together at the two extremities of the upper horizontal part, to which extremities the two piston-rods, *d, d*, are fastened ; and the said sides are also united at the lower extremity of the upright stem, *f, f*, by the joint-pin, *s*, for the lower end of the connecting-rod, *g* ; the said two parallel sides whereof the tee-shaped cross-head is compounded, being so far apart one from the other as will leave between them a space sufficient for the connecting-rod, *g*, to work in, as is clearly shewn in figs. 3, 4, and 5. The lower end of the connecting-rod, *g*, is fitted with a joint upon the pin, *s*, which is fixed across between the lower extremities of the upright stems, *f, f*, and serves to unite those extremities together, as already mentioned, and as is shewn in fig. 4. And the upper end of the connecting-rod, *g*, is fitted with a similar joint upon the crank-pin of the crank, in the usual manner of the connecting-rods and cranks of ordinary marine steam-engines. *p, p*, figs. 2 and 4, are the

two sliding-pieces which are fixed at the lower ends of the upright stems, *f, f*, of the tee-shaped cross-head. Those sliding-pieces, *p, p*, are fastened to both the stems, *f, f*, as is shewn in fig. 4, and form as it were a sort of box, within which the joint at the lower end of the connecting-rod, *g*, is enclosed, but without touching the interior of such box. The two sliding-pieces, *p, p*, are each formed of a salient-angle, which angles are fitted to move up and down in angular grooves, formed in the two upright straight edges, *r, r*, figs. 2 and 4, which are fixed within side of the interior of the small cylinder, *b, b*, at opposite sides of the circumference of that interior, so as to constitute a parallel vertical guiding-groove, *r, r*, within that interior, into which groove the lower ends of the stems of the tee-shaped cross-head are fitted by means of the sliding-pieces, *p, p*, so as to move freely up and down in accordance with the motion of the annular-piston, *c, c*, but with liberty of lateral deviation from a vertical motion. The two ends of the joint-pin, *s*, for the lower end of the connecting-rod, are reduced to small joint-pins, which project out on each side beyond the sides, *s*, of the tee-shaped cross-head; and on those pins are fitted the lower ends of two links, *g, g*, for working the air-pump, the upper end of those links being jointed to the long ends of two levers, *k, k*, situated one on each side of the tee-shaped cross-head, *e, e*; and from the opposite or short ends of those two levers the rod, *l*, of the air-pump, *z*, is suspended by two suitable links, both of which are jointed to the said rod, *l*. The fulcrum, or centre of motion, *t*, of the two levers, *k, k*, is common to both levers, and is sustained by suitable framing. The two levers, *k, k*, act as one, and may be considered as one lever compounded of two parallel sides with sufficient space left between those sides to admit the tee-shaped cross-head to work in that space.

The remaining parts represented in the drawing having no relation to my improvement, do not require much

description ; and those parts may be constructed in any manner which is preferred. The horizontal axes, *i, i, i*, of the cranks, *h*, are the same as usual in steam-engines. The several bearings for the said axes are sustained in one horizontal line in a framing of iron which is affixed between two parallel wooden beams extending horizontally across the vessel, from side to side thereof, and the iron framing is upheld by four upright props of wrought-iron, which are erected on and firmly affixed to the base whereon the cylinder, *a, a*, stands, these props passing up through holes in four ears which project outwards from the exterior flange around the top of the cylinder, *a, a*, the props being by that means firmly retained in place in respect to each other and to the steam-cylinder, *a, a*, and thus retain the said framing which carries the bearings for the axes of the cranks, at an invariable position in respect to the steam-cylinder, *a, a*. The base whereon the steam-cylinder, *a, a*, stands, is made to serve for the condenser, being prolonged out one way from beneath the cylinder, as shewn in fig. 4, also figs. 1 and 2, in order to admit the air-pump, *z*, to be placed in it. That air-pump, with its bucket and valves, and the hot-well, also the hot-water pump or pumps may be constructed in any mode used in steam-engines. The said base or condenser also has a lateral branch projecting out from beneath the cylinder to receive the lower end of the sliding-valve, by which the same is distributed to the cylinder ; and the said branch serves as the exhaust-passage for exhausting the steam from the cylinder and conveying it down into the condenser. The upper-surface of the said base or condenser serves as the bottom, *n, n*, of the steam-cylinder, *a, a* ; and a lateral-passage, *y*, may be formed within the said base or condenser to lead beneath the open space within the small cylinder, *b, b*, and give access to the joint at the lower end of the connecting-rod, as already mentioned. The sliding-valve for distributing the steam to the cylinder, as represented in the drawing, is what is called a tee

sliding-pipe valve, of the same kind as is most commonly used in marine steam-engines, but any other kind of distributing-valve or valves may be used, either one or two or four sliding-valves, or four lifting-valves, as may be preferred, those parts having no reference to my improvements. And as to the parts commonly called working-gear, for giving the requisite motion to the sliding-valve, from an eccentric on the axle, *i*, of the cranks, those parts are not represented in the drawing, because the manner of applying suitable working-gear is familiar to competent engineers, and may be arranged in various ways, and must be applied to suit the kind of distributing-valve or valves which is used, and has no relation to my improvement. And as to dimensions of engines which are constructed according to my improvement, the steam-cylinder, *a, a*, must be larger than the usual size for the steam-cylinder of an engine of like power on the ordinary construction, in order to compensate for the space taken up by the small cylinder, *b, b*, within the steam-cylinder *a, a*. The horizontal area of the annular-space between the two cylinders (or of the annular-piston, *c*,) must be fully equal to the horizontal area of the cylinders (or of the piston) of an engine of like power, on the common construction. If a straight line, such as the dotted line, *x*, fig. 4, is drawn, in the manner of a tangent to the circle of the exterior of the small cylinder, *b, b*, the said line will also form a chord within the circle of the interior of the steam-cylinder, *a, a*, and the length, *v, x*, of that chord will give the diameter of a cylinder (see the dotted circle), fig. 6; which having a piston of the ordinary construction, would have the same horizontal area, as the annular cylindrical space and annular piston, *c, c*, will have. And as to the dimensions of all other parts, they should be proportioned to the power of the engine (which is constructed according to my improvement), in the same manner as in ordinary steam-engines, all which is well understood by competent engineers, and has no reference to my improve-

ment. The drawing is drawn to a scale of half an inch to a foot, or one twenty-fourth of the real size, and represents an engine of 100 horse power. And note, although the tee-shaped cross-head, *e, f*, has been described and represented as being compounded of two parallel sides united together, leaving a space between them to receive the connecting-rod, nevertheless the said cross-head may be made in one piece, the connecting-rod being in that case double, or composed of two parallel-rods, disposed one on each side of the tee-shaped cross-head, those two parallel-rods may unite together into one, at the upper end above the horizontal part, *e, e*, of the tee-shaped cross-head, so that the point at the upper end of the connecting-rod will be the same as already described and represented; but at a short distance below that joint, the connecting-rod will divide into two, in the manner of a fork, to go down at each side of the upright stem of the tee-shaped cross-head and the lower joint-pin, *s*, being fixed across the two parts of the rod, from one to the other, will unite them together; the joint which is fitted on the pin, *s*, being at the lower end of the upright stem of the tee-shaped cross-head. In this way the cranks, *h, h*, on the rotative axis, may require to have somewhat more space left between them, in order to admit the forked part of the connecting-rod to go up between the cranks, when the rod is near to the top of the stroke. And note, although the steam-cylinder has been described and represented as standing in a vertical position, that circumstance has no reference to my improvement; and if preferred, the cylinder may be placed in any other position; for instance, the steam-cylinder may be inclined at an angle of forty-five degrees to the vertical, and two engines having their cylinders so inclined (but inclining in contrary direction), one to the other, may be combined with the joints of the upper ends of their respective connecting-rods, jointed side by side on the same crank-pin which will, in that case, serve for both engines; because the direction in which the pistons of the two

engines act on that crank-pin will be at right angles one to the other. This is a well-known mode of combining two engines, and each of the engines which are so combined may, if requisite, be made longer, in proportion to the length of the stroke made by the piston, than is the case in the engine represented in the drawing; and consequently the cylinders will be further distant from the axes of the cranks: the inclining position of the cylinders will permit of such increase in the length of the connecting-rod being made without the axis of the cranks being at any higher level than represented in the drawing; and such increased length may be given if it is requisite, in order that the ends of the tee-shaped cross-heads of the engine may not interfere one with the other, in working by the said mode of combination on one crank-pin.

Having now described my said improvement in the arrangement and combination of certain parts of steam-engines, to be used for steam navigation, I, the said, Joseph Maudslay, do hereby declare, that I make no claim to the exclusive use of a piston constructed in an annular form with two piston-rods, as hereinbefore described, nor to the exclusive use of one steam-cylinder within another, leaving an annular-cylindrical space between them, within the steam-cylinder, for the said annular piston to work in; a cylinder-cover in an annular form, with two stuffing-boxes thereon, for the two piston-rods, as hereinbefore described: all those parts having been already proposed to be used, nearly in the same forms, as hereinbefore described, for that particular kind of steam-engine which is commonly known as Woolf's Compound Engine, with two steam-cylinders and pistons, *viz.*, a small steam-cylinder and piston to receive high-pressure steam from the boiler, and a large steam-cylinder and piston to receive the same steam after it has been discharged from the small steam-cylinder, in order that the steam may act over again in the large steam-cylinder, with an expansive action of the steam. It has been pro-

posed to place such small steam-cylinder and piston within the large steam-cylinder and piston, the latter being of an annular form, and having two piston-rods through the cover, being also of an annular form, with two stuffing-boxes in it for those two piston-rods; but in steam-engines constructed according to my improvement as hereinbefore described, no piston works in the small cylinder, or can be applied therein, neither is there any cover to that small cylinder, and in fact it is not a steam-cylinder, for no steam is even admitted into it; the interior thereof, is a mere open space which receives the connecting-rod with its appurtenances, as hereinbefore described; *viz.*, the upright stems of the tee-shaped cross-head, and the joint-pin for the connecting-rod, and the sliding-pieces at the lower ends of those stems along the upright straight edges forming the grooves, wherein those sliding pieces move up and down so as to produce the effect of a paralld motion; also the links for working the air-pump; all which parts are received within the interior of the small cylinder, as hereinbefore described; and the only object of using a small cylinder in engines constructed according to my improvement, is to obtain a central open space for those parts to work in.

Neither do I claim by virtue of the aforesaid letters patent, of the 16th of March, 1841, the exclusive use of the tee-shaped cross-head, hereinbefore described, and which had a piston-rod united to each extremity of the upper horizontal part of such tee-shaped cross-head, and the lower end of the connecting-rod or rods being jointed to the lower end of the upright stem or stems of such tee-shaped cross-head, and the said lower ends being also guided to move up and down with sliders in parallel grooves, so as to answer the purpose of a parallel motion. Because such tee-shaped cross-head with the aforesaid appurtenances thereto, and nearly (although not quite) in the same form as hereinbefore described, constituted a part of improvements in the construction of marine

steam-engines, for which former letters patent were granted by Her present Majesty to me, the said Joseph Maudslay, conjointly with Joshua Field, on May 7, 1839. But in that case, the said two piston-rods which were united to the two ends of the horizontal part of the tee-shaped cross-head, belonged to two distinct pistons working with simultaneous motion in two distinct steam-cylinders, each of those pistons and steam-cylinders by itself, being nearly of the ordinary kind, and the upright stems of the tee-shaped cross-head, and the connecting-rod worked up and down in a space left for that purpose between the said two steam-cylinders, wherefore, neither of the said steam-cylinders was situated with its centre immediately beneath the axes of the cranks; but according to my present improvement, the same or a similar tee-shaped cross-head, and two piston-rods with the connecting-rod and other parts or appurtenances aforesaid, are arranged and combined so that the connecting-rod with its said appurtenances will be received in the open space which is left for that purpose within the interior of the small cylinder, and the two piston-rods aforesaid are affixed to the opposite sides of the annular-piston which surround the said small cylinder.

Wherefore I claim as the new invention, whereof the exclusive use is granted to me by the aforesaid letters patent, of March 16, 1841, the improvement hereinbefore described, in the arrangement and combination of the parts (hereinbefore mentioned) of steam-engines to be used for steam navigation; the distinguishing character of that improvement being, that the connecting-rod with the requisite appurtenances of that rod, as hereinbefore enumerated, is situated and works within a space which is left vacant for the reception of those said parts, within the interior of the small open topped cylinder, which is fixed in the central part of the steam-cylinder, and within the central part of the annular-piston-rod, works up and down in the annular cylindrical space that is

left between the interior of the steam-cylinder and the exterior of the said small cylinder, as hereinbefore fully described.—In witness whereof, &c.

JOSEPH MAUDSLAY.

Enrolled September 16, 1841.

Specification of the Patent granted to GEORGE EDWARD NOONE, of Hampstead Road, in the County of Middlesex, and Church Street, Blackfriars Road, in the County of Surrey, Civil Engineer, for Improvements in Dry Gas-Meters.—Sealed February 18, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—My invention of improvements in dry gas-meters consists in a novel arrangement of mechanism, by the application of which to meters of this description, the quantity of gas passing through them from the street-main to burners, for the purposes of illumination, may be registered or ascertained with greater precision, even at the lowest pressure to which, in operation, they are likely to be submitted. The improved mechanism is, moreover, calculated to prevent the possibility of gas passing through meters without being registered; owing to its being placed in an inclined position it is not liable to derangement, and is protected from the danger of becoming corroded by the gas.

My invention also consists in an improved mode of manufacturing the flexible partition or diaphragm, commonly used in such meters, for the purpose of forming the two chambers, in each of which alternately the gas, as it passes through the meter, is retained, in order that its quantity may be registered before proceeding to the burner. The object of this improvement is to regulate the size of the diaphragm, so that the degree of

in it which is best suited, for the due working of the meter may be always secured. These improvements will, I conceive, be readily understood upon reference to the accompanying drawing, and the following description thereof.

Description of the Drawing.

Fig. 1, is a transverse vertical section of the meter, taken in the line, *a, b*, shewing the parts as they would appear just at the time when the pressure of the in-coming gas upon the flexible partition or diaphragm, has caused a change in the passages, that is to say, the gas which has entered one of the chambers being retained, there is now a passage opened for its departure through the exit-pipe to the burner, and the opposite chamber, just exhausted of gas, is free to receive a fresh supply, to act in like manner upon the opposite side of the diaphragm. In this figure the gas-passages are shewn in red lines.

Figs. 2 and 3, are back and front sections of the meter in the lines, *c d*, and *e f*; and,

Fig. 4, is a horizontal section in the line, *g h*, the parts, being represented in the positions they would occupy at the period just mentioned. In all these figures similar letters indicate corresponding parts, *A* and *B*, are the two chambers or compartments, into which the water is divided by the flexible partition or diaphragm, *a*, composed of leather or other suitable material, fastened to the casing by a ring of metal, as shewn, or otherwise as desired. *b*, is a jointed lever connected with the diaphragm, through which motion is communicated to the several working parts, placed upon the axle or shaft, *c*, suitably mounted in bearings at *d*. *e*, is a pipe through which the gas enters the meter from the main, and *e**, a pipe through which, when registered, it is conducted therefrom to the burner. *f*, is a passage or way communicating with the pipe, *e*, and (what I call) the disc-way, *g*; the latter is furnished with a plug of the

form and construction hereinafter to be described, which is acted upon by the bent lever, *h*, through the weighted cam or tumbler, *i*, in such a way that the gas-passages become changed, each time that the parts are thrown over on either side, by the pressure of gas upon the diaphragm in that direction. *k*, is a passage or way by which the gas enters the chamber or compartment, *A*; and *l*, is also a passage or way, through which it is introduced into the chamber or compartment, *B*, in each instance passing through the disc-way, *g*, as its plug is made to form a communication between one or other of these passages, and the entrance-pipe, *e*. *m*, is a bent lever on the shaft; *c*, acted upon by the weighted cam or tumbler, *r*, which lever, from its connexion with an another lever, *n*, on the opposite side of the shaft, *c*, transmits motion from the above named working parts to the registering apparatus.

I proceed now to describe the operations of this my improved mechanism applicable to dry gas-meters. The positions of the two working parts being as above stated, that is, the communication between the main and the chamber, *A*, closed, and at the same period opened to the chamber, *B*. Supposing gas at this time, to be coming into the meter, through the pipe, *e*, it will pass along the way, *f*, through the disc-way, *g*, which will now permit it to continue its course along the passage or way, *l*, into the chamber, *B*; having arrived there, it exerts a pressure upon the diaphragm, *a*, in the direction of from left to right (in fig. 1,) causing it to move in that direction, taking with it the lever, *b*, which lever setting the shaft, *c*, in motion carries with it the weighted cam or tumbler, *l*; the latter having proceeded until it has passed beyond a verticle position falls over, by its gravity, on to the side opposite to that shewn in the drawing, the consequence of which is that the plug in the disc-way, *g*, is now made to open a communication between the chamber, *B*, and the pipe, *e**, through which the gas pas-

ses from this chamber to the burner along the way, *l*. A communication is now also formed between the pipe, *e*, (leading from the main) and the chamber, *A*, through the passages or ways, *f* and *k*, when the supply of gas continuing, the above described operation of the working parts is repeated from right to left (fig. 1). It will be observed, that the above stated movement of the cam or tumbler, *i*, would, through the connection shewn between it and the lever, *n*, cause the end of the latter next the shaft, *c*, to be depressed, occasioning a corresponding elevation to its reverse end, which, acting upon the teeth of a small trundle-wheel, *o*, (as shewn) impels it forward a short distance; now, on the axis of this wheel, *o*, is fitted a worm, taking into a worm-wheel, which latter is thereby made to communicate motion to the gearing, in connexion with the dial plates, so graduated as to point out the quantity of gas passing through the meter. I would first observe here, that the end of the lever, *n*, which acts upon the wheel, *o*, is jointed, as at *p*, in order that in returning it shall slide freely past the next tooth, but when past it presents a rigid obstacle to the tooth, and in due time lifts it forward, as described. It must, also, be stated that the wheel, *o*, is prevented from returning by a pall and ratchet-wheel. I desire now to explain more particularly the construction of what I have called the disc-way, *g*, which is represented full size in the longitudinal and two transverse sections, figs. 5, 6, and 7.

Figs. 8 and 9, exhibit in plan and elevation, its plug detached with the lever, *h*, by which it is worked. The disc-way, it will be seen, consists of a kind of hollow cross, the upper and lower arm of which communicate with the pipes *e**, and *e*, and the two side arms with the chambers, *A* and *B*; in the centre of this cross is placed the plug, constructed as follows:—In the first instance, a regular solid plug is formed, by grinding it so accurately to fit the internal cylindrical surface of the chamber or

way in the centre of the cross. All the intervening portions between the two ends or discs, *q* and *r*, are then filed away until the plug assumes the form shewn at figs. 8 and 9, leaving the two ends or discs, *q* and *r*, to steady its action. It will be perceived that by this construction of plug, there is but a small portion of its working surface exposed to the corroding influences of the gas, only the two thin edges, *s, s*, so that the friction is likely to be lessened, as also the liability to derangement incidental to the ordinary form of cocks and valves.

Fig. 6, shews the position the plug would occupy under the circumstances supposed in the description of figs. 1, 2, 3, and 4; and,

Fig. 7, exhibits its appearance at the time it is made to open the opposite passages.

I come now to describe the means for preventing gas from passing through the meter without being registered, in consequence of its being placed at an angle of inclination, in order to which reference must be had to fig. 1, wherein, *t, t*, are two small weighted levers, having their fulcrums at *u, u*, so placed that the upper of two pins, *v, v*, extending from the cam or tumbler, *i*, (which, it will be remembered, acts upon the plug in the disc-way, *g*, through the bent lever, *h*,) shall be easily embraced by a forked or hooked end, *w*, of either lever, *t*, when the meter is in a vertical position; when, however, it is made to incline to either side, the weight on the lever, *t*, tilts up its forked-end, *w*, which embraces the pin, *v*, and prevents the cam or tumbler, *i*, from reaching the vertical position, consequently the supply of gas to the burners is shut off, until the meter is again put upon something approaching a level; hence will be seen the impossibility by this arrangement of obtaining gas for consumption in a fraudulent way.

I will now speak of my improved mode of manufacturing the diaphragm, in illustration of which, I refer to figs. 10, 11, 12, and 13.

Fig. 10, is a plan or horizontal view, shewing the top of the mould over which the flexible material, to form the diaphragm, is to be stretched when in a damp state. The mould consists of a number of segments (say four) of hard wood, or other suitable material having joints at their extremities nearest the centre, by means of which joints the opposite extremities may be expanded or collapsed; these segments are so proportioned and constructed, as to admit of a wedge-piece, *t*, (seen in the underneath plan, fig. 11,) being inserted between them, in order to complete the hemi-spheroidal form required in the entire block or mould. The flexible material is to be placed over the mould, and tied round upon a loose metallic ring which it encircles, (as represented in the elevation, fig. 12), thumb-screws are then applied to the ears or lugs, 2, 2, which cause the wedge-piece, *l*, to advance in between the segments and force them out, until together they form the hemi-spheroidal figure required for the diaphragm; the flexible material is in this state allowed to dry, when it is finally removed from the block or mould, in the following manner:—In the first instance it is cut round, just below the tying; the wedge-piece, *i*, is next withdrawn from beneath the segments by the thumb-screws, when the former will collapse and allow of the complete suitably formed diaphragm, with the ring being drawn over the tap. It will be obvious, that by this mode of manufacture, the size of the diaphragm will always be an uniform object of considerable importance in the construction of meters, as by means of it the evil of getting the diaphragm so small, that it shall in working become completely distended, is effectually obviated; besides, in the manufacture of a number of (say five light) meters were there is a want of uniformity in the size of their several diaphragms, a considerable difference in the registration of the gas would soon become manifest.

Having thus described my invention of improvements in dry gas-meters, I would remark, in conclusion, that the arrangement of mechanism, hereinbefore mentioned,

as applicable to such, might possibly, in some slight respects, admit of modification with advantage, as for instance, the cutting off the supply of gas when the meter was placed in an inclined position, might be otherwise effected. A simple disc placed upon the shaft, *c*, with a couple of notches cut in its circumference, might, by having a slightly weighted lever upon a fixed fulcrum to drop into one of its notches, retain the cam or tumbler, *i*, and prevent its vibratory action to and fro. Again, the contrivance shewn in the drawing and described above, might be applied to the lever, *h*, directly; in other respects also trifling alterations in the arrangement of the working parts might hereafter be found desirable in practice. I desire, however, to claim, as secured to me by the above in part recited letters patent, the spirit and legitimate scope of that, which as a principle of construction has been set forth in this my specification, excepting such parts of the apparatus or mechanism, as have been known and used before, but to which, for the sake of perspicuity in my description, I have necessarily alluded.—In witness whereof, &c.

GEORGE EDWARD NOONE.

Enrolled August 18, 1841.

Specification of the Patent granted to FREDERICK BROWN, of Luton, in the County of Bedford, Iron-monger, for Improvements in Stoves or Fire-Places.
—Sealed September 24, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—

Description of the Drawing.

Fig. 1, represents an elevation of a stove or fire-place constructed according to my invention.

Fig. 2, shews a section thereof; in each figure the same letters are used to indicate similar parts. *A*, is the external cylinder containing the fire-place, *B*; but it should be remarked, the external casing, *A*, may be made of a different shape provided the mode of its combination with the internal chamber, *B*, containing the fire be retained. At the lower end of the interior chamber, *B*, is placed the grating of fire-bars as is shewn. *a*, is a piece of talc fixed in the cover, *b*, such cover being applied to the upper part of the chamber, *A*, there being a sand-joint, *f*, formed between the upper surface and the loose cover, *b*. The air for supporting combustion, enters at the opening, *d*, which has a ventilator or regulator to control and regulate the quantity of air passing to the fire. The air which passes through the ventilator or regulator, *d*, passes up the pipe, *i*, and is conducted to the upper compartment, *A*¹, of the chamber, *A*, such upper compartment being formed by means of the partition, *l*, through which the pipe, *i*, passes. In the partition, *l*, is formed an opening through which the chamber, *B*, is passed, and by means of a sand-joint, *h*, the air in the upper and lower compartments of the chamber, *A*, are prevented mixing. *c*, is an opening with a regulator or ventilator for the passage of air into the lowest compartment, *A*² of the chamber, *A*, such compartment being formed by the partition, *n*, through which the pipe or tube, *k*, passes; hence any air which is admitted at *c*, will be conducted to the lower compartment, *A*², of the chamber, *A*, and pass off by the pipe, *m*, to the pipe, *n*, from whence it may be conducted in any direction, or permitted to flow into the room in which the stove is placed. *e*, is a close door of the ash-pit, and it will be seen that when in use, there is no air intentionally admitted into the compartment, *A*², within which the chamber, *B*, is placed; hence, whatever atmosphere or vapour may be contained in that chamber, will be from the fire, and the products of combustion will pass from the cham-

ber, A^2 , by the pipe, o , to a chimney. g , is the entrance into the chamber or fire-pail, B .

I will now describe the mode of using the stove: observe, that there is a sufficient quantity of sand in the two grooves to render them air-tight; take care that the fire-pail and the ash-hole are properly cleaned out previous to lighting the fire; put some shavings, straw, or paper, into the ash-hole, also put some shavings or paper in the fire-pail, with a few pieces of dry wood; close the ventilator at the back, take off the top, b , open the ash-hole door and ignite the shavings or paper, and as soon as they are lighted, close the door, and light the fuel in the fire-pail, then put on a few pieces of coke, and as soon as they are fairly lighted, the pail may be filled up with fuel, the ventilator, c , at the back opened to its full extent, the cover or top, b , put on, and the draught regulated by the ventilator, d , in front, according to the degree of heat required. If the bottom of the fire-pail should require cleaning out while the stove is in action, open the ash-hole door, and rake it with a hook; as soon as this is done, close the door again, or the fire will soon go out. Coke or anthracite coal is preferred to any other fuel. It will thus be seen, that the atmospheric air for supporting combustion, is introduced above, and descends down amongst the fuel, the products of combustion passing down between the fire-bars into the compartment, A^2 , and from thence as described.

Having thus described the nature of my invention, and the manner of carrying the same into effect, I wish it to be understood, that I do not confine myself to the precise details shewn, so long as the peculiar character of my invention be retained.

But what I claim, is the mode of placing a chamber, B , having fire-bars or suitable grate within a chamber, A , when the air for supporting combustion of the fuel in the chamber, B , is caused to pass downwards through and amongst the fuel, and the products of combustion pass

between the fire-bars or grating as described.—In witness whereof, &c.

FREDERICK BROWN.

Enrolled March 24, 1842.

Specification of the Patent granted to GEORGE THORNTON, of Brighton, in the County of Sussex, Civil Engineer, for certain Improvements applicable to Railways, Locomotive-Engines, and Carriages.—Sealed December 23, 1840.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My invention consists in various improvements, under three heads, viz., railways, locomotive-engines, and carriages, and refer, in the first place (with regard to railways), to a difference of gauge in the width of the rails from that now existing, arising from the following practical observations. First, the original gauge of four feet eight inches and a half, and the more recent improvements of five feet, have both been found in practice to be too narrow to admit of a proper and free arrangement of the machinery of the locomotive, and also creating at great speeds, an unpleasant transverse oscillation of the carriages, with the liabilities at high velocities, to fly off at a tangent from quick curves; on the other hand, the seven feet gauge appear to entail too great a weight in the construction of the locomotives and carriages, and consequently a proportionate expense. This increased weight and width of gauge, also involves a considerable increase of outlay on and in the construction of the railway and bridges. Looking then at the question fairly, between the existing gauge of rails, it would seem desirable that some medium or national width should be adopted, and the simple gauge of six feet (or thereabouts) presents itself, as admitting a

desirable width for a convenient arrangement of machinery in the construction of the locomotives and carriages without extremes of weight or expenditure in any department.

In explaining the next head of my invention, viz., improvements applicable to locomotive engines, I would observe that it has been found in practice that a six feet wheel is as high as can be usefully employed, so as to combine the two advantages of power and speed; and it seems to be in mechanical unison with the six feet guage. I would also propose to make the flanges of the wheels of the locomotive and carriages deeper than they now exist, viz., to not less than two inches and a half, which would greatly tend to lessen the liability of engines and carriages getting off the rails.

My next improvement in reference to engines, consists in the application of a self-acting governor attached to the steam-pipe, which in all cases regulates the power of the engine, and prevents excess of speed; being independent of the engine-driver. It cuts off the steam when passing down inclined planes, or when in any other manner too great velocity has been attained; but allowing the engine-driver to apply any desired extent of power in the case of heavy loads, as this apparatus merely prevents an excess of speed beyond that at which the governor is set, which is at present at the discretion of the engine-driver.

My invention under this head consists, thirdly, in the use of a self acting water-guage or regulator, which preserves an equable height of water in the boiler.

The fourth feature of this part of my improvements consists in casing and surrounding the smoke box or chimney end of the engine, with a stratum of water, which is pumped into this auxiliary directly from the tender, and there retained by means of a stop-valve, and thence admitted as required into the boiler, after absorbing the hitherto waste heat escaping from the tubes, and prevents the turning out of the plates of the smoke box and chim-

ney, the joints of the steam-pipes and steam-chest covers, which till now has been a common occurrence, and a great desideratum to avoid.

My fifth improvement applicable to locomotive engines, refers to a tube in connection with the safety valves on the boiler, which tube carries off the surplus steam into the chimney, thus increasing the draught, doing away with much disagreeable noise, and preventing the steam, as heretofore, from flying in the face of the driver, and obstructing his view of the line.

The sixth feature of my improvements under this head, consists in the employment of an universal jointed pipe connected with the bottom of the boiler of the chimney end, and attached to a blow off cock, for the purpose of cleaning out the boiler tubes, by directing a jet of hot water and steam through them, thus more speedily effecting the desired object than by the present imperfect method of using a rod of iron with tow at the end.

My last improvement as relates to locomotive engines, consists in the use of self-acting breaks on the wheels, which breaks are raised by the pull of the engine, through the medium of an apparatus for that purpose, between the engine and tender, which, when the engine ceases to draw (either from necessary or emergent causes), descend upon the wheels with great force and stop the engine, and which breaks are also further available under the discretionary use of the engine-driver.

The third head of my improvements refers to railway carriages, and consists in the application thereto of self-acting breaks, raised by a traction-rope in connection with and pulled by the engine, and which fall upon the wheels when the rope in its necessary duty, or from emergent accidental causes, becomes slack, and thereby stops the progress of the carriages before they run into danger. By the traction-rope this engine draws and works in considerable advance of the train, so that in case of collision, of the engine upsetting, running off the rails in

falling into a recent slip of an embankment in the night (which before now has occurred), the rope immediately becomes slack, and the breaks instantly descending with suitable force upon the wheels of the carriages, bearing them up safely into a state of rest, before the train arrives at the scene of danger. The length of traction rope between the engine and train prevents any danger to life and property from accidental explosion; it also prevents the ignition of goods trains from hot ashes emitted out of and descending from the chimney of the engine (as has occasionally occurred), when silks, cottons, and other goods of considerable value have been consumed. On one of the axles of the tender a drum and apparatus are fixed, for letting out the traction-rope to such a length as may be required to suit the curves of existing railways, in which the rope is peculiarly serviceable, by always pulling round the trains from a tangential direction, and thereby preventing the danger of a train flying off the rails in a straight line under high speeds. This rope may also be wound up by the same drum, to such length as may be required to draw up the train into their proper position in existing stations or termini. It may be necessary to observe, that this letting out or taking up of the rope can be accomplished without any interruption to the progress of the train. I proceed now to refer to the accompanying drawings in illustration of these my several improvements.

Description of the Drawing.

Fig. 1, represents an irregular section of the speed governors on top of boiler, incased by a dome, through which access to the governors is obtained, by removing the screws on flange, B, B. C, C, are stuffing-boxes formed in the upper casing of the boiler, through which a vertical rod or shaft, D, works; this shaft is connected with the throttle-valve, E, in the steam-pipe, F, as shewn, which is closed or opened as the rod or shaft, D, rises or falls, by the expanding or collapsing of the revolving balls, and

thus the admission of steam to the cylinder, and consequently the speed of the engine, is regulated as required. The shaft, *D*, is set in motion by one of the axles of the engine-wheel, through the gear work, as shewn at *G*.

Figs. 2 and 3 represent a transverse and longitudinal section of the water regulator, which is composed of a copper ball, acting upon a vertical spindle, *B*, working through a stuffing-box, *C*, in the top of boiler, fig. 2, and is elevated or depressed with the level of the water acting upon a valve, *D*, fig. 3, through the lever, *E*, and rod, *F*, thus always retaining the same level of water in the boiler.

Fig. 4, represents an irregular section through the engine, with an auxiliary cistern, *A, A*, round the chimney end of the boiler, as described. The stratum of water formed by this cistern round the smoke-box, might, if thought desirable, be extended round the chimney to any height. *B*, represents the cock, and *C*, the blow-off pipe for the purpose of cleaning the tubes, which tube is jointed, so as to admit of being removed in any required direction, which for convenience is here shewn, also in the smoke-box. In connection with the engine and tender, are self-acting breaks, *D*, coming into operation in a way similar to the carriage breaks described immediately below, but giving the engineer a discretionary power in their use by application of the lever, which acting upon the pivot or fulcrum, *F*, depresses the slot-bar, *C*, and forces back the bar, *H*, which connects the tender and engine; there are helical-springs within the box at *I*, to give greater pressure to the breaks.

Fig. 5, is a plan, and

Fig. 6, an elevation of a train of carriages with the break apparatus attached at *K, K*.

Fig. 7, is an enlarged longitudinal, and

Fig. 8, a transverse section through carriages, in which *K*, is the draw-bar, which passes under each carriage in the train, and is connected at each end by the buffer

and connecting chain, *L* (see figs. 7 and 8) ; in this bar are two wedge inches, *M, M*, over which work the pulley, *V*, in connection with the weigh-bar, and breaks, *O, O*, and *P, P*, in the centre of the carriage, around the draw-bar, in a helical spring, having a double action against the collars, *R, R*. When the engine begins to move, the bar is pulled forward, the pulley rises in the guides, *S, S*, and with it the breaks rise from all the wheels of each carriage throughout the train, and which, thus prepared, starts into motion. When the engine stops the spring, *T*, acting from either end, draws the bar into its place, lets the break drop upon the wheels, to which will be attached sufficient weight to stop the train in any required distance, according to the length of the traction-rope.

Figs. 9 and 10, are enlarged side elevations, and plan of carriage connector, *A, A*, being the buffer bars, *C, C*, connecting chain, and *D*, the attachment link, each apparatus having sufficient play between the carriages to admit of the drum bars raising the breaks.

Figs. 11 and 12, show a drum on the axle of the hind wheels of the tender, to which drum, *A*, is attached a rope, *B*, the working of which is brought into operation by means of the clutch gear, *C*, when required. The object of this apparatus, and mode of effecting the purpose are described before.

Having thus described my several improvements applicable to railways, locomotive-engines, and carriages, I would remark, that I do not mean or intend to confine myself to the precise arrangement of mechanism shewn and explained for the various purposes set forth, as I conceive that in respect of minor points of detail, practical experience may (under some circumstances probably at present unforeseen) lead me to some slight modifications; neither do I lay claim to any parts of locomotives which have been heretofore used, but which have been necessarily referred to in this my specification; what however I claim as secured to me by the above in part recited letters pa-

tent, are, in the first place, a kind of medium guage (say about six feet) of the rails upon railways, calculated to afford the advantages alleged at the outset.

Secondly, in reference to locomotive-engines, I claim, first, the use of wheels with an increased flange, such as are shewn and described. Secondly, an arrangement of apparatus, by means of which the speed of the engine is regulated with much easier precision, without the agency of the driver.

Thirdly, a self-acting water guage or regulator.

Fourthly, a preparatory heating of the water supplied to the boiler for the generation of steam by a vessel inserted in the smoke-box.

Fifthly, a mode of constructing the waste steam-tube attended with the advantages hereinbefore set forth.

Sixthly, a method of cleaning out the tubes of the boiler with more efficiency and despatch than by the present practice, and

Lastly, a means of stopping the engine by the use of self-acting breaks upon the wheels.

And I claim under the third head of these improvements, self-acting breaks raised from the wheels of the carriage by the pull of a traction-rope descending with impeding force simultaneously upon all the wheels in a train, when the rope ceases to operate upon them by its becoming slack. And moreover, in concluding this my specification, I would state that my firm belief is, that the several features of my improvements above laid claim to, may be advantageously employed, either individually and collectively, for the various purposes to which they are herein described as being applicable, according to local circumstances.—In witness whereof, &c.

GEORGE THORNTON.

Enrolled June 23, 1841.

Specification of the Patent granted to WILLIAM RYDER, of Bolton, in the County of Lancaster, Roller and Spindle Maker, for a certain Improved Apparatus for Forging, Drawing, Moulding, or Forming Spindles, Rollers, Bolts, and various other like Articles.—
Sealed February 8, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—
My improved apparatus for forging, drawing, moulding, or forming spindles, rollers, bolts, and various other like articles in metal, consists of a novel combination, arrangement, or construction of mechanism, designed for the purpose of effecting these several operations by mechanical power or agency, instead of performing the same by manual labour as hitherto done. The principle object of my present invention, is to forge, draw down, mould, or form, spindles, shafts, &c., whilst in a heated state, by means of a continuous succession of blows, rapidly performed by hammers, swages, or dies, and to give the required form to the spindle-shaft or other article under operation, by placing it under the striking or forging apparatus during the rotation or action of the machinery, which would complete the necessary form or shape of the article under operation, in a much more perfect and economical manner than hitherto accomplished by hand labour. I would here observe, prior to entering into the detailed description of my improved apparatus to be used for such purposes, that the size, strength, and proportions of all the essential parts of the apparatus must be varied, in order to suit the particular class of work to be performed, as it will be evident, that the same construction of apparatus which would be sufficient for forging, hammering, or forming light spindles, rollers, shafts, bolts, or nuts, such as used for cotton machinery, and other comparatively light purposes, as blanks, files, and cutting-tools,

cutlery, &c., would not be sufficiently strong for performing the same work upon shafts or axles of two, three, or more inches in diameter, such as are used for mill-gearing or other heavy purposes. And yet, the same principles of my invention may be equally adapted and carried into practical operation upon either the larger or smaller scale of work, providing of course, that the several proportions, strength, and arrangement of the mechanism, shall be suitably modified to the quality or class of work to be performed. Such being the case, I have attached to these presents a sheet of drawings, containing views of my improved apparatus, and of a light construction, such as should be employed for forging spindles, rollers, &c., for cotton machinery, or articles for other light uses. By way of illustrating with facility the application of my improvements, similar letters of reference will be found upon corresponding parts in all the figures.

Description of the Drawing.

Fig. 1, represents a side elevation of my improved apparatus, drawn upon a scale of about two inches to the foot.

Fig. 2, is a front view ; and,

Fig. 3, a transverse section taken vertically through the same ; an iron frame-work, *a, a, a, a*, suitably connected together by means of cross-bearers, *b, b, b, b*, supports in pedestals the driving-shaft, *c, c*, upon one end of which are keyed the fast and loose strap-pulleys, *d, d*, and upon the reverse end, the balance or fly-wheel, *e*. Upon this shaft, *c*, a series of eccentrics, cams, or cranks, *f, f, f, f*, are either forged or otherwise conveniently fixed, revolving with it, and bearing in bed or cradle pieces, *g, g, g, g*, which vibrate slightly, as the eccentrics revolve above them, and bear at their lower extremities upon the upper ends of the punches or bars, *h, h, h, h*, and thus cause them to descend rapidly at every revolution of the eccentric.

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trics or cams, *f, f, f, f*, their instantaneous ascent being alternately effected by means of the springs, *i, i, i, i*, one end of which bears against the cross-bearer, *b*, and the other being placed in the punch or bar, *h*. Thus it will be observed, that this series of punches or bars, *h, h, h, h*, are made alternately to slide up and down in the guides or cross-bearers, *b, b, b, b*, at every revolution of the driving-shaft, and perform a rapid reciprocating action (and may be said to constitute the striking-hammers of the machine). There are similar bottom bars, *k, k, k, k*, (which may be said to constitute the anvils of the machine,) which are also supported by the cross-bearers, *b, b*, their lower extremities bearing upon suitable elastic or spring beds, *l, l, l, l*, these beds are intended slightly to relieve any sudden concussion between the hammers, *h, h*, and the anvils, *k, k*, during the forging operation; pairs of dies, swages, or hammers, *m, m, m, m*, of any suitable form, are placed respectively at the extremities of bars, *h, h*, and *k, k*, into or between which the heated rod or bar to be forged, drawn, or moulded, is to be placed by the operator or smith, and supported upon the adjustable rest, *n, n*, as shewn in red lines in fig. 3, and there being held and turned by the hands of the smith, as in the ordinary manner of forging iron, the machinery being in motion, the forging or hammering apparatus will operate rapidly upon the heated-shaft, as shewn by the red-lines in the sectional figure. The vertical parts of this apparatus are also shewn detached at fig. 4, being the eccentric, *f*, and driving-shaft, *c*, the vibrating-cradle piece, *g*, and the punch or hammer, *h*; the punch in this instance is somewhat modified, being provided with an internal spring, *o*, to effect its ascent after every stroke, in place of low springs, *i*. The apparatus may also be conveniently furnished with a pair of cutting-dies or shears, *p, p*, to pair or cut the ends of shafts, rollers, &c., if required, being worked by the operator pulling the hand-lever, *q*, and thus raising the lower cutter, *p*,

by means of the eccentric, *r*, or in any other convenient manner.

Having now particularly described my invention, and the manner in which the same is to be performed, I desire it to be particularly understood, that I claim as my invention, the improved apparatus for forging, drawing, moulding, or forming spindles, rollers, bolts, and various other like articles, as herein particularly set forth and exhibited in the drawings attached, and more especially the mechanical combination of the eccentric cam or crank, *f*, with the cradle-piece, *g*, the top and bottom bars or swage-holders, *h*, and *k*, with their swages; also the use or employment of a spring as at *i*, for the purpose of lifting or keeping up the punch, *h*, and cradle-piece, *g*, against the eccentric, *f*, and the elastic or spring-bed, *l*, when employed for these purposes, in whatever manner the construction, form, or dimensions of the apparatus may be modified or varied.—In witness whereof, &c.

WILLIAM RYDER.

Enrolled August 7, 1841.

Specification of the Patent granted to DAVID NAPIER, of Mill Wall, in the County of Middlesex, Engineer, for Improvements in Propelling Vessels. — Sealed March 22, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—

Description of the Drawing.

One part of my invention consists in placing two wheels or propellers, of equal diameter, at the stern of the vessel, the axes of both to be above the level of the water, and one wheel further aft than the other, so as to admit the blades or float-boards of one wheel, to work nearly up to

the axle of the other wheel, and so that the float-boards or blades of one wheel works clear of the blades or floats of the other wheel, as is represented in figs. 1 and 2. I would remark, that I am aware that it has before been proposed to use two propellers at the stern of a vessel, the blades or floats of each of which work in the spaces of the other, in a somewhat similar manner to cogs of two cog-wheels; but, I believe, such mode has or will prove unsuccessful: my mode of employing two wheels with oblique blades or floats, is in such manner, that the one wheel will be before the other, and not working one into the other, as is clearly shewn figs. 1 and 2.

Another part of my invention is represented in figs. 3 and 4, and consists in connecting all the floats, A, to a metallic frame, B, the weight of which is sufficient to keep the floats in a nearly vertical position, the floats being fixed on axles, C, on the ends of which are cranks, D, to which the metallic frame is suspended, such frame, B, being unsupported by any eccentric collar or bearing.—In witness whereof, &c.

DAVID NAPIER.

Enrolled September 22, 1841.

Specification of the Patent granted to WILLIAM JAMES BARSHAM, of Bow, in the County of Middlesex, Gentleman, for Improvements in Fastening Buttons, and other articles, on Wearing Apparel and other descriptions of Goods and Manufactures.—Sealed April 5, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—My invention relates, first, to the mode of fastening buttons by means of a spring catch; and,

Secondly, my invention relates to a mode of construct-

ing brace-buttons, in order to their being more securely fastened by sewing.

And in order that my invention may be most fully understood and readily carried into effect, I will proceed to explain the drawing hereunto annexed, in the various figures of which the same letters are used to indicate similar parts.

Description of the Drawing.

Fig. 1, shews a front view of a portion of cloth having a button fastened according to my invention.

Fig. 2, shews a back view of the same piece of cloth.

Fig. 3, shews a section of the piece of cloth, and also of the button attached thereto.

Fig. 4, shews a plan and section of the button.

Fig. 5, shews a plan and edge view of a spring-catch ; and,

Fig. 6, shews a plan and side view of the eye or shank used with the spring-catch in fastening the button.

a, is the button, which has a recess sunk in the face, as shewn, in order to receive the spring-catch, *b* ; and the edges of the recess are under-cut in order that when the spring-catch, *b*, is sprung or pressed into the recess it will be retained from coming out by any action which may take place, at the same time it may readily be removed when desired. The button may be of horn or other suitable material. *c*, is an eye or shank, by which the button is attached : this eye or shank is similar to a small button, as is shewn at figs. 2, 3, and 6 ; but the construction may be varied, as will be seen by examining figs. 7, 8, and 9 : thus

Fig. 7, shews a side view and plan of a suitable shank, made by coiling wire, as is shewn ; and there is an advantage in this arrangement, that the part, *c*¹, acts as a spiral-spring at the back of the cloth, having at all times a tendency to draw the button towards the cloth, yet giving way on any sudden pull on the button.

Fig. 8, shews another arrangement of eye or shank, made by bending wire into the figure or shape indicated by the side view and plan of figure 8; and

Fig. 9, shews another construction of shank, which is produced by cutting or stamping a portion of metal-plate into the shape shewn at (1), and bending it into the shape shewn in plan and side view, (2), (3), as shewn at fig. 9.

In some cases, I use the parts, *a*, *b*, as a means of fastening other buttons, as is shewn at fig. 10, where *d*, is an ordinary button having a common metal shank, *c*; and *a* and *b*, are the button and spring-catch of fig. 1, as will readily be seen on examining fig. 10.

The mode of fixing buttons on to garments consists simply in making holes through the fabric and passing through proper shanks, then placing the frame of the spring-catches into the recesses formed in the buttons, *a*, in such manner that the spring-tongues, *c*, pass through the shanks, as is shewn in the figures above described.

The second part of my invention relates to a mode of constructing buttons, that in fastening them they may stand off from the garment, and yet have the thread by which they are affixed protected.

Fig. 11, shews a front and back view of a portion of cloth having a button affixed according to this part of my invention.

Fig. 12, shews the section of the same piece of cloth, and also of the button by which the construction of the parts by which it is affixed to the cloth, will be more readily traced and understood.

Fig. 13, shews a plan and section of the button.

Fig. 14, shews a side view and section of a hollow stem which is placed between the button and the cloth to which the button is attached: by this means the button will be held at a distance from the fabric, as is shewn. This hollow stem may be separate from the button, as shewn, or form part thereof by being made therewith or affixed thereto before sewing it to a garment, the object being to keep the but-

on off from the cloth to which it is affixed, and in such manner that the tube or stem shall simply cover the thread by which it is affixed.

And I would remark, that I am aware that buttons have been before made with hollow stems acting as shanks; but in such cases, the point of bearing of the thread was at the end of the stem nearest the garment: but in this mode of fixing buttons the bearing of the thread will be seen to be at the surface of the button itself, and at the end of the hollow stem which is farthest from the fabric to which the button is affixed. *c*, is a button suitable for being affixed according to this part of my invention. *c*, is the hollow stem which, as before stated, may be separate from or form part of the button. *e*¹, is the point of bearing of the thread by which the button is affixed. In sewing on buttons constructed according to this part of the invention, the thread may also pass over a holding-surface, *b*, at the back, as is shewn, or there may be a piece of canvass, or the thread may simply be fastened to the cloth.

Figs. 15, 16, and 17, shew a front view, a back view, and section, of a portion of cloth with another button affixed thereto, according to this part of my invention; and,

Fig. 18, shews a plan and side view of the stem.

These parts differ slightly from those above described, inasmuch as the hollow stem is affixed to the cloth, and the button is capable of sliding on the stem, all which will readily be understood on examining the figures of the drawing now under description.

Figs. 19, 20, and 21, shew a front view, a back view, and a section, of a portion of cloth with a button affixed thereto; and

Fig. 22, is a plan and side view of a hollow stem to be used therewith: in this case, in place of the holes through the button itself being used to sustain the thread at the point, *e*¹, there is a plate, *b*, such as before described, *er.*-

ployed; or the plate, *b*, in place of having a spring-tongue, as shewn, may be a complete ring with a bar, *b*, across from side to side; or the plate, *b*, may simply have holes formed therein for the passage of the thread and needle.

Figs. 23, 24, and 25, shew a front view, a back view, and a section of a portion of cloth with another button affixed thereto according to this part of my invention, but varying from those before described, but still having the peculiar character of the thread being sustained at a point at the end of the hollow stem farthest from the garment: in this case the button is placed on the stem, but cannot be drawn off, or the stem may be fastened to the button.

Having thus described the nature of my invention, I would have it understood that I do not confine myself to the precise detail shewn, provided the peculiar characters of my invention be retained; but what I claim is,

First, the mode of employing a spring-catch, *b*, with a button, *a*, and suitable eye or shank, as above described; and,

Secondly, I claim the mode of applying hollow stems in affixing buttons, as above described. — In witness whereof, &c.

WILLIAM JAMES BARSHAM.

Enrolled October 5, 1841.

Specification of the Patent granted to ALFRED ELAM, of Huddersfield, in the County of York, Surgical Instrument Maker, for Improvements in Apparatus or Instruments for the Relief and Cure of Procerencia, and Prolapsus Uteri.—Sealed September 20, 1841.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c. &c.—
My invention relatés to a mode of applying springs to

the straps, which are connected with the pad used in instruments for the relief and cure of procedencia and prolapsus uteri; and in order that the invention may be most fully understood, I will proceed to describe the drawing hereunto annexed, in the various figures of which the same letters indicate similar parts.

Description of the Drawing.

Fig. 1, represents the apparatus or instrument complete, having my improvements applied thereto.

Fig. 2, shews a side view and plan of a pad and parts of the straps attached thereto.

Fig. 3, shew one of the straps which support the pad separately, the outer covering being removed, in order to shew the application of the spring, according to my improvements.

The object of which instruments or apparatus of this description, is to support the uteri within the vagina by an easy and agreeable pressure upon the vagina, afforded by elastic springs, which, when applied according to the directions herein given, produce a permanent immoveable and invariable pressure in all positions of the body upon the perenium; and, if desired, absorb on the abdomen, thereby keeping the uterus within the vagina, and stimulating the relaxity of the vagina to contract. A, A, are two shoulder-straps attached to the back part of the waist-belt, at c¹; and at the front part of the same there are button-holes to button on to the front part of the belt, at B, B; the shoulder-straps are made of cotton, or other suitable fabric or material. C, the waist-belt, which is made with or without metal springs, as is well understood, and covered with leather, flannel, or other fabric or material. F, is a strap attached to the waist-belt, C, with holes, to button on to the fore part of the belt, at E. G, is a coiling-spring made of metal (steel being preferred) and has a strap attached to the upper end of it, with button holes, to button to the back part of the belt, C, also a

strap attached to the other end of the spring, G, continued under the pad, K, to the end of the strap, J, with button-holes to button on to the front-spring, H. The spring, G, is covered with either leather, cotton, or other suitable material, the one end near the pad, K, being made fast, while the other end is left open to allow the spring to extend when applied. K, is an oval-shaped pad, made of cork, sponge, horse-hair, flannel, or other suitable material, as heretofore, either with or without a spring on the inside. H, is a coiling elliptical-spring which has a strap attached to the upper end of it with holes to button on to the waist-belt at E; this strap is made of leather, cotton, or other suitable material; and at the lower part of the spring is attached a strap, and at the end of the strap a buckle by which the strap, J, is fastened to the strap at the lower part of the spring, H. The spring, H, is covered with leather, cotton, or other suitable material, and the upper end of this cover is left open to allow the spring to extend and return while the lower part is sewed fast. To apply the apparatus, let the waist-belt, C, D, be opened out and fitted round the waist; C, being at the back, and the strap, F, brought round and buttoned in the front upon the knob or button, at E; then the shoulder-straps, A, A, being crossed behind, are to be brought over the shoulder and buttoned to the waist-belt, at B, B; the strap, J, which is fixed to the pad, K, is to be brought forward between the thighs and buckled to the front strap, H, sufficiently tight to afford a comfortable pressure and support upon the perenium; the pressure of the pad, K, may be regulated by raising or lowering the straps at the knobs or buttons, C and E. The dotted lines at L, shew an abdominal pad made of metal covered with silk, cotton, or other suitable material, attached by buttons, or sewed to the outside cover of the front-spring, H, by which means pressure is also obtained to the abdomen.

Having thus described the nature of my invention and the manner of performing the same, I would wish it to be

understood that I do not confine myself to the precise details here shewn and described; but what I claim is, the mode of applying springs, G, H, to the straps, by which the pad used is sustained, as above described.—In witness whereof, &c.

ALFRED ELAM.

Enrolled April 20, 1842.

Specification of the Patent granted to WILLIAM THORP and THOMAS MEAKIN, of Manchester, in the County of Lancaster, Silk Manufacturers, for certain Improvements in Looms for Weaving, and also a new Description of Fabric to be produced or woven therein.—Sealed November 20, 1838.

WITH AN ENGRAVING.

To all to whom these presents shall come, &c., &c.—Our invention of improvements in looms for weaving, and also of a new description of fabric to be produced or woven therein, consists in the peculiar arrangement and order of working certain ordinary parts of looms in general, so that a new description of cloth shall be produced or woven by such arrangement.

Our new description or manufacture of cloth or fabric is more particularly adapted to that class of woven silk goods called “satin,” the ordinary quality of which has one face highly finished and glossy, owing to the brilliancy of the warp threads being thrown up on one side or surface, and leaving the back of the goods of course presenting a dull unfinished appearance, owing to the absence of the warp threads to the sight. Now by our improvements in the arrangement and order of working this ordinary loom, in which such or similar goods are woven, and also by introducing a double set of warp threads, we are enabled to produce a novel description and quality of goods,

having a perfect or distinct face or finished surface on each side of the fabric, and are enabled also to present two entirely separate colours of goods, one upon each side or surface of the piece, and without having the slightest difference in the appearance, finish, or brilliancy, upon either side, and thus as it were producing a double cloth, having two perfect sides or surfaces, and bound or held together by one shute or weft. The manner in which such produce or manufacture is to be woven, is entirely dependent upon the peculiar order or succession of working the treadles, in order to divide or "shed" the two different coloured warps in such a manner, that a certain number of threads shall always be "floating" to cover the weft on each side; and also a certain number of threads shall only arise and fall at suitable intervals, to bind the "pick." As such peculiar operation and improvement is likely to be interesting, or perfectly intelligible, only to competent and practical weavers, we have attached to these presents certain diagrams, and explained the same in such a manner as will enable persons, conversant with the ordinary process of weaving, to produce our new manufactures in almost endless variety.

Description of the Drawing.

It may be necessary to add that the word "draft," written upon the various figures on the drawing annexed, signifies the order in which the warp threads are entered through the headles or healds; and that the word "treading" signifies the order in which the weaver in hand looms, or tappets in power looms, works over the treadles, in order to open the proper sheds. The warp threads are to be prepared and wound upon the beam as usual; but in case the cloth required is to have two distinct colours, that is one upon each side or surface, then the warps must of course be of the colours of the intended satin, and each colour wound upon the warp beam, alternate side by side, as represented by the red and blue lines in all the dia-

grams, which show the draft or arrangement of the warp threads. The marks or crosses thus, X X, placed upon the threads, indicate the manner in which the threads of the warp rise and sink, to receive the weft or shute, in order to produce the style of cloth or fabric required; the black cross being the rising, and the red cross the sinking thread, as the case may be. The black lines (in all the figures) represent the treadles connected to the "shafts" or rails carrying the harness or healds; and the figures marked upon such black lines indicate the order of the treading in which the weaver works. The figures upon the warp threads are for the convenience of reference, and will perfectly illustrate the effect of the peculiar and unequal rising and sinking of the warp threads, in order to produce the new double faced cloth; as for example, with reference to fig. 1, in the drawings, which represents the order of the working to produce a perfect "five shaft satin," with an equal face or surface upon each side, and of two separate and distinct colours, the weft or shute in all cases being put in at every shedding of the warp, as usual. Thus, as in diagram fig. 1, the following table shews the order of the working.

The first treadle rises the warp threads, marked

		1, 4, 6, 8, 10, and sinks 2, 3, 5, 7, 9
The second,	..	2, 4, 5, 8, 10, and sinks 1, 3, 6, 7, 9
The third,	..	2, 4, 6, 8, 9, and sinks 1, 3, 5, 7, 10
The fourth,	..	2, 3, 6, 8, 10, and sinks 1, 4, 5, 7, 9
The fifth,	..	2, 4, 6, 7, 10, and sinks 1, 3, 5, 8, 9

Fig. 2, shews the order of working the loom to produce a perfect "seven shaft satin," with an equal surface on each side.

Fig. 3, shews the order of working to produce a perfect "eight shaft satin," with an equal surface on each side.

Fig. 4, shews the order of working to produce perfect satin upon one side or surface, and an ordinary "tabby" cloth upon the other side.

Fig. 5, shews the order of working to produce a perfect satin upon one side, and a single twill upon the other.

Fig. 6, shews the order of working to produce a perfect satin upon one side, and a double twill upon the other.

Fig. 7, shews the order of working to produce a perfect satin upon one side, and a plush or velvet upon the other; in which figure it will be seen, that the numbers 2, 4, 6, 8, 10, 12, 14, 16, are satin warp threads, and numbers 1, 5, 9, 13, constitute the ground of the velvet or plush, while the numbers 3, 6, 9, 12, in the treading, are its pile threads, in which wires are to be inserted, with grooves ploughed upon one edge, as in ordinary velvet weaving. Now it will thus be evident, by a careful inspection of these diagrams, that there is always a sufficient number of warp-threads floating above and below the weft thread, as it enters the sheds, to cover the two binding threads, so that thus each colour for the warps will be kept upon distinct sides of the piece, and that every pick or shute that crosses, takes a shaft from each colour, to bind the pick or shute.

Having now particularly described our invention, and the manner in which the same may be carried into practical effect, we desire it to be understood, that we are not only confined to hand-loom weaving, as power looms may also be similarly arranged, in the order of working the tappets and treadles, and thereby enabled to effect precisely the same result; nor are we confined to the produce of any description or variety of fabric, either plain or figured, or composed of silk, flax, cotton, wool, or any mixture of such or any other fibrous materials, capable of being thus woven: but we claim as our invention, the above described improvement in looms for weaving, and thereby producing an entirely novel description of cloth or fabric, having two equally perfect and finished sides or surfaces, either of similar or distinct colours, qualities, or materials; having represented and described the working

of silk, to produce satin goods, merely for the sake of illustration.—In witness whereof, &c.

WILLIAM THORP.

THOMAS MEAKIN.

Enrolled April 22, 1839.

*Specification of the Patent granted to OGLETHORPE
WAKELIN BARRATT, of Birmingham, Metal Gilder,
for certain Improvements in the Precipitation or
Deposition of Metals.*—Sealed September 8, 1841.

To all to whom these presents shall come, &c. &c.—
My improvements in precipitation or deposition of metals, consist first, in the application of electric currents for the purpose of depositing copper and its alloys, taken into solution in the acids employed during the processes of cleaning such metals. I take a saturated solution of copper in the mixed acid, known as dipping aqua-fortis by the trade, in the proportion of six to eight water, and one acid; this I put into a convenient vessel, having two copper wires placed parallel with each other on the edges of the vessel, these wires I connect with a battery in the usual way. The work to be cleaned is suspended upon the wire in connection with the copper or negative metal of the battery, and a plate or plates of copper corresponding with a larger area than the area of the surface of the work to be cleaned, is or are suspended on the other wire, such plate or plates being intended to receive the metal deposited from the solution. In from five to ten minutes, the scale or oxide of copper on the surface will be removed; another lot of work is then introduced under the same arrangement. If the articles to be cleaned are required bright upon the surface, I add free acid in the proportion of one part acid, to ten of the saturated solution before named; or if the surface be required of a dead

appearance, I add muriatic-acid in the proportion of one to two parts of muriatic-acid to twelve of the saturated solution of copper, according to the dead effect desired.

Secondly, my invention consists of a mode of precipitating zinc upon other metals from its solution, by the application of electric currents, and which I effect as follows :—I dissolve metallic zinc in diluted sulphuric-acid cold ; composed of one part acid to eight water, when the acid and zinc cease to act upon each other, the solution is fit for use. I attach the articles to be coated with zinc, to the positive plate of the battery, and a plate of somewhat less in surface than the articles to be coated, to the negative plate, and immerse them in the solution of zinc ; it should be remarked, that in this case, the zinc used in the battery and in the solution, is not amalgamated, but in case amalgamated-zinc be used in the battery, then I slightly amalgamate the zinc for such plate or plates used as above explained, the deposition may be continued till the required coating is obtained. Other acid and saline solutions of zinc may be employed as those in muriatic and acetic acids, and the muriate of ammonia, or the sulphate of zinc of commerce, in connection with the battery, but I have found the former succeed perfectly.

Thirdly, my invention consists of a mode of precipitating copper upon iron and other metals ; my improvements are two fold. First, I take an acidulated solution of sulphate or other salt of copper ; what I have commonly used is a saturated solution of sulphate of copper, containing about four or five per cent. of free sulphuric-acid, and having connected the articles to be coated by means of a wire or strip of copper to a plate of zinc attached to the other end of the wire or strip of copper, I immerse the articles and the zinc so connected into the solution of copper employed. I prefer to inclose the zinc plate in a wrapper of cloth or strong paper, to prevent the deposition of the copper upon the zinc-plate, and I

have been able by this arrangement, to produce a more perfect contact of the metals, particularly where iron is desired to be coated, than by any of the modes heretofore recommended or described, when using acid solutions of copper.

The second part of my improvements in coppering metals, relates to the employment of certain salts of copper, as the solutions of the oxides of copper, instead of the acid solutions heretofore employed, and which is more particularly applicable to the coating of iron or other metals, which are preserved in a negative state and with difficulty in the acid solutions. I take eight pounds by weight of cyanuret of potassium, and two pounds of cyanuret of copper, and three gallons of water, or I sometimes use sulphate of copper in the proportion of two and a half pounds instead of the previously proposed cyanuret of copper; these I introduce into a copper-vessel, or a vessel having copper-plates therein, and having boiled them together for three or four hours, I then attach a wire from the negative-plate of a battery to the copper-plates or to the copper-vessel, and bring the articles to be coated into the boiling solution, in connection with the positive plate of the battery: the deposition of the copper commences immediately, and may be continued till the desired thickness is obtained. Other preparations of copper may be dissolved in the cyanurets of potassium or sodium, to answer this part of my invention, and carbonates of potassium or sodium may be used in place of cyanurets; but, so far as my experience goes, not so successfully as the cyanurets. This solution may be used at different temperatures, but the action is most rapid when boiling. If iron articles are required to have a surface of brass, I deposit zinc upon the copper surfaces obtained, as above described, and coat thereon with zinc, as is above directed under the head of zinc, and afterwards submit them to a heat of about 300 degrees Fahrenheit, in a muffle or other convenient apparatus.

Fourthly, my invention relates to a mode of precipita-
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ting platinum from its solutions, as a covering to other metals; first, I take a solution of platinum, taking the precaution to have free acid present, and immerse a zinc-plate in connection with the article or articles to be coated, as previously directed in this specification under first directions for precipitating of copper, as explained in this specification. If the platinum be deposited of a dark colour, it is in consequence of too much surface of zinc being acted upon by the solution; this process is most desirable for coating the interior of chemical and other vessels. Another process is to dissolve the platinum in the following salts:—I take twelve parts by weight of muriate of soda, two parts alum, and one part cream of tartar, and as much water as will dissolve the salts; in this solution I boil metallic platinum for eight or ten hours, adding water as evaporation renders it needful, to keep the salt in solution; copper, iron, and other metallic articles introduced into the solution when boiling, are speedily coated; but if a stronger coating be required, I attach the battery, and an anode of metallic platinum, and continue the action till the desired thickness be obtained. Palladium may also be employed in like manner to that above described for platinum.

The fifth part of my invention consists of a mode of precipitating copper from waters of copper-mines and other waters containing copper. The mode of precipitating copper from the waste water of copper mines, and other waters containing copper, as at present practised, is, to form shallow pits to hold the solution of copper, then precipitate the copper, by placing iron in the solution, when the copper is swept off from time to time by the workmen, which leaves in the solution precipitated copper-ochre and other waste. In working according to my improved mode, I form pits similar to the above, but deeper, to hold the solution of waste copper or other metal. I place in the solution a porous vessel of earthenware, in proportion to the size of the pit holding the solution, or divide pits by any convenient porous material.

Into the porous vessel, or the pit partitioned off by the porous material, I put a solution of muriate of soda, or the waste water itself may be used. Into the porous vessel containing the muriate of soda, or other solution, I place the iron, and connect it, with wires, with sheets of copper, lead, or other metal, in the solution of copper, and which are to receive the deposit of pure metal; the solution, after all the copper is precipitated, will serve to dissolve the iron in the porous cell instead of the muriate of soda. I am aware that copper and other metals have been precipitated from the waste water of copper and other mines by immersing iron in the solution of copper or other metal, to which I lay no claim.

The sixth part of my invention consists of a mode of precipitating gold, or silver, or platinum, on to other metals, by employing the sulphuret of gold, or of silver, or of platinum. In order to obtain a suitable solution of gold, silver, or platinum, I dissolve in hydrate of potash by boiling; if it is for a thin coating, the articles are to be immersed in the above solution when boiling, and in a short time they will be coated; if a thicker coating is wanted, it may be obtained by connecting the article in the above solution with a galvanic or other battery, and by using a gold, or a silver, or a platinum anode; I thus precipitate gold, or silver, or platinum, on to the metal articles introduced into the solution.

The seventh part of my invention consists of a mode of precipitating alloys of metals, when in solution, on to the articles of metal immersed in such solution. In performing this part of my invention, I obtain the alloy of metals, which are to be precipitated by any convenient means; that which I generally practise, is as follows:—I take sulphurets of the metals in the proportions I propose to use them, in alloy, and dissolve in cyanuret of potassium; and then I proceed in the same manner as just described, (when using a galvanic or other battery,) in respect to gold, silver, and platinum, using an alloyed anode agreeing with the proportions contained in the solution.

Having thus described the nature of my invention, and the manner of performing the same, I wish it to be understood that what I claim, is, First, the mode of cleaning copper and its alloys by means of a galvanic or other battery, and also recovering, by precipitation, the metal dissolved during the process.

Secondly, I claim the mode of obtaining a coating of zinc on to other metals by precipitating zinc from solutions, by means of a galvanic or other battery.

Thirdly, I claim the mode of precipitating copper from solutions, by connecting the article to be coated with copper to a piece or pieces of zinc, as described, and dipping them in the solution of copper used. And I also claim the mode of coating articles of metal, by causing copper to be precipitated by a galvanic or other battery from solutions of copper in the cyanides and carbonates of potash and soda. And I also claim the mode of producing a coating of brass by precipitating copper and zinc, by means of a galvanic or other battery, from solutions thereof, and then applying heat, as above explained.

Fourthly, I claim the mode of precipitating platinum from a solution of that metal, having free acid present, by means of zinc or other positive metal introduced into the solution. And I also claim the mode of precipitating platinum or palladium from the salt solution, above described, by the aid of a galvanic or other battery.

Fifthly, I claim the mode of precipitating gold, silver, and platinum on to other metals, by employing the sulphuret of gold, or of silver, or of platinum, when dissolved in hydrate of potash, with or without the aid of a galvanic or other battery.

And, Sixthly, I claim the mode of precipitating metals in the state of alloy by obtaining them in solution, and using an anode of an alloyed metal of the same proportion as is in solution.—In witness whereof, &c.

OGLETHORPE WAKELIN BARRATT.

Enrolled March 8, 1842.

NOTICE OF EXPIRED PATENTS.

JAMES MOFFALL, of King's Arms Yard, Coleman Street, in the city of London, Master Mariner, for an improvement in apparatus for stoppering and securing chain-cables, also for weighing anchors attached to such chain or other cables, either with or without a messenger.—Sealed June 3, 1828.

DANIEL JOBBINS, of Uley, in the county of Gloucester, Millman, for an improved method by certain machinery applicable to stocks or fulling machines of milling and scowering woollen cloths and other fabrics requiring such process.—June 3, 1828.

BARON CHARLES WETTERSTEDT, of Commercial Place, Commercial Road, in the county of Middlesex, for a liquid or composition for water-proofing and strengthening leather.—Sealed June 4, 1828.

RICHARD WITTY, of the township of Hanley, in the county of Stafford, Engineer, for certain improvements in apparatus for making and supplying coal-gas for useful purposes.—Sealed June 10, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 480.*)

EDMOND GIBSON ATHERLEY, of York Place, Portman Square, in the county of Middlesex, Esquire, for an apparatus for a method of generating power applicable to various purposes.—Sealed June 12, 1828.—(*For account of specification, see Repertory, Vol. 9, third series, p. 289.*)

WILLIAM STRACHAN, of Avon Eittia, in the parish of Ruabon, in the county of Denbigh, Manufacturer, for an improvement in the making or manufacturing of alum.—Sealed June 12, 1828.—(*For copy of specification, see Repertory, Vol. 8, third series, p. 519.*)

JOHN BARTLETT, of Chard, in the county of Somerset, Shothread Manufacturer, for a new and improved method or methods of manufacturing process for preparing flax thread or yarn, for use in the manufacture of boots, shoes, sadlery, and of sail and of other cloths and bagging.—Sealed June 16, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 479.*)

GEORGE JOHNSON YOUNG, of the town and county of Newcastle-upon-Tyne, Iron Founder, for a machine whereby an additional and improved purchase or power will be given in working ships, windlasses, and capstans.—Sealed June 21, 1828.—(*For account of specification, see Repertory, Vol. 8, third series, p. 411.*)

SAMUEL PRATT, of New Bond Street, in the parish of St. George, Hanover Square, in the county of Middlesex, Camp Equipage Maker, for certain improvements on elastic beds, cushions, seats, pads, and other articles of that kind.—Sealed June 25, 1828.

PATENTS GRANTED FOR SCOTLAND,

From March 29, to May 17, 1842.

MOSES POOLE, of Lincoln's Inn, in the county of Middlesex, Gentleman, for improvements in the manufacture of plaited fabrics. Communicated by a foreigner residing abroad.—Sealed March 29, 1842.

JAMES HUNT, of Whitehall, in the county of Middlesex, Gentleman, for improvements in the manufacture of bricks.—Sealed March 29, 1842.

JAMES HALL, of Gloucester, Upholsterer, for improvements in beds, mattresses, and apparatus applicable to bedsteads, couches, and chairs.—Sealed March 30, 1842.

JOHN HARWOOD, of Great Portland Street, in the county of Middlesex, Esquire, for an improved means of giving expansion to the chest.—Sealed April 6, 1842.

JAMES ANDREW, of Manchester, in the county of Lancaster, Manufacturer, for certain improvements in the method or process of preparing or dressing yarns or warps for weaving.—Sealed April 6, 1842.

EDMUND MOREWOOD, of Winchester Buildings, Great Winchester Street, in the city of London, Esquire, for an improved mode of preserving iron and other metals from oxydation or rust. Communicated by a foreigner residing abroad.—Sealed April 7, 1842.

HENRY BOOTH, of Liverpool, Esquire, for improvements in the method of propelling vessels through water.—Sealed April 13, 1842.

WILLIAM BROCKEDON, of Queen Square, in the county of Middlesex, Gentleman, for improvements in the manufacturing fibrous materials for the cores of stoppers to be coated with India-rubber and used for stopping bottles and other vessels.—Sealed April 13, 1842.

CHRISTOPHER NICKELS, of the York Road, Lambeth, in the county of Surrey, Gentleman, for improvements in the manufacture of plaited fabrics.—Sealed April 13, 1842.

JAMES SMITH, of Deanston Works, in the parish of

Kilmadoch, and county of Perth, Cotton Spinner, and JAMES BUCHANAN, of the city of Glasgow, Merchant, for improvements applicable to the preparing and spinning of cotton, wool, flax, hemp, and other fibrous substances.—Sealed April 13, 1842.

MATHIAS NICHOLAS LA ROCHE BARRE, of St. Martin's Lane, in the county of Middlesex, Manufacturer of Cotton, for an improvement in the manufacture of a fabric applicable to sails and other purposes.—Sealed April 19, 1842.

REUBEN PARTRIDGE, of Cowper Street, Finsbury, in the county of Middlesex, Engineer, for certain improvements in machinery or apparatus for splitting and shaping wood into splints for the manufacture of matches and other similar forms.—Sealed April 20, 1842.

RICHARD DOVER CHATTERTON, of Derby, in the county of Derby, Gentleman, for certain improvements in propelling.—Sealed April 22, 1842.

THEOPHILE AUTON WILHELM COUNT DE HOMPESECH, of Burich Castle, near Aix-la-Chapelle, in the kingdom of Prussia, for improvements in obtaining oils and other products from bituminous matters, and in purifying or rectifying oils obtained from such matters.—Sealed April 22, 1842.

JOHN VENABLES, of Burslem, in the county of Stafford, Earthenware Manufacturer, and JOHN TUNNICLIFF, of Burslem, aforesaid, Bricklayer, for a new and improved method of building and constructing ovens used by potters and china manufacturers in the firing of their wares.—Sealed April 25, 1842.

WILLIAM NEWTON, of Chancery Lane, in the county of Middlesex, Civil Engineer, for an improved machine or apparatus for weighing various kinds of articles or goods. Communicated by a foreigner residing abroad.—Sealed April 27, 1842.

JOSEPH ATKINSON, of Braham Hall, near Harrowgate, in the county of York, Farmer, for improvements in

thrashing and winnowing machines.—Sealed May 4, 1842.

JOHN CARR, of North Shields, in the county of Northumberland, Earthenware Manufacturer, and AARON RYLES, of the same place, Agent, for an improved mode of operating in certain processes for ornamenting glass.—Sealed May 6, 1842.

HENRY BARRON RODWAY, of Birmingham, in the county of Warwick, Wine Merchant, for improvements in the manufacture of horse-shoes.—Sealed May 12, 1842.

Sir JAMES MURRAY, of Merrion Square, in the city of Dublin, Knight, and Doctor of Medicine, for an improved method of combining various materials in a manner not hitherto in use, for the purpose of manure.—Sealed May 12, 1842.

JOHN GEORGE BODMER, of Manchester, in the county of Lancaster, Engineer, for certain improvements in machinery or apparatus for cleaning, carding, roving, and spinning cotton, and other fibrous substances.—Sealed May 16, 1842.

PETER KAGENBUSCH, of Wetter on Rhur, in Westphalia, in the kingdom of Prussia, Dyer, but now residing in the parish of Whitby, in the county of York, in England, for an improvement in the dyeing of wool, woollen cloth, cotton, silks, and other fabrics and materials.—Sealed May 17, 1842.

LIST OF NEW PATENTS.

HENRY BARCLAY, of Bedford Row, for a composition or compositions applicable as tools or instruments for cutting, grinding, or polishing glass, porcelain, stones, metals, and other hard substances.—Sealed Aprilth 30, 1842.—(*Four months.*)

JOHN ROBINSON, of Watney Street, Commercial Road,

East, Engineer, for improvements in windlasses and capstans.—Sealed May 3, 1842.—(*Six months.*)

JOHN RAILTON, of Blackburn, Machine Maker, for certain improvements in machinery or apparatus for weaving.—Sealed May 3, 1842.—(*Six months.*)

GODFREY WETZLAR, of Middleton Square, Clerkenwell, Master of Arts, for improvements in rendering fabrics waterproof. Communicated by a foreigner residing abroad.—Sealed May 7, 1842.—(*Six months.*)

JOSEPH WARREN, of Heybridge, Essex, Agricultural Implement Maker, for certain improvements in ploughs.—Sealed May 9, 1842.—(*Six months.*)

FRANCIS PUNIE WALKER, Junior, of Manchester, Coal Merchant, for certain improvements in the manufacture of candles, candlesticks, or candleholders, and in the apparatus connected therewith.—Sealed May 9, 1842.—(*Six months.*)

GEORGE HARVE, of Manchester, Gentleman, for certain improvements in machinery or apparatus for sweeping or cleaning chimneys and flues.—Sealed May 9, 1842.—(*Six months.*)

THOMAS EDGE, of Great Peter Street, Westminster, Gas Apparatus Manufacturer, for certain improvements in apparatus for measuring gas, water, and other fluids.—Sealed May 9, 1842.—(*Six months.*)

SAMUEL HALL, of Basford, Civil Engineer, for improvements in the combustion of fuel and smoke.—Sealed May 9, 1842.—(*Six months.*)

JACOB WILSON, of Wigmore Street, Cavendish Square, Upholsterer, for certain improvements in bedsteads.—Sealed May, 9, 1842.—(*Six months.*)

WILLIAM SANDERSON, of Aldermanbury, Silk Manufacturer, for improvements in weaving fabrics to be used for covering buttons.—Sealed May 9, 1842.—(*Six months.*)

JOHN MELVILLE, of Upper Harley Street, Esquire, for certain improvements in propelling vessels.—Sealed May 11, 1842.—(*Six months.*)

JOHN BROWNE, of Brighton, Gentleman, for improvements in the manufacture of mud-boots and overalls.—Sealed May 12, 1842.—(*Six months.*)

THOMAS WILLIAMS, of Bangor, Smith, for an improved churn.—Sealed May 17, 1842.—(*Six months.*)

WILLIAM BRUNTON, of Meath, Glamorgan, Civil Engineer, for an improved method or means of dressing ores, and separating metals or minerals from other substances, —Sealed May 19, 1842.—(*Four months.—For colonies only.*)

JOSEPH GIBSON, of Birmingham, Manufacturer, for certain improvements in axle-trees and axle-tree boxes.—Sealed May 23, 1842.—(*Six months.*)

JOHN BENEER LAWES, of Rotherhamstead, Hertford, Gentleman, for a certain improvements in manures.—Sealed May 23, 1842.—(*Six months.*)

JAMES PILBROW, of Tottenham, Engineer, for certain improvements in steam-engines.—Sealed May 23, 1842.—(*Six months.*)

JOHN BISHOP, of Poland Street, Jeweller, for a new or improved construction of brake-apparatus applicable to railway-carriages.—Sealed May 23, 1842.—(*Six months.*)

THOMAS MIDDLETON, of Laman Street, Borough, Engineer, for an improved method of preparing vegetable gelatine or size for paper, and also an improved mode of applying the same in the manufacture of paper. Communicated by a foreigner residing abroad.—Sealed May 23, 1842.—(*Six months.*)

WILLIAM TUDOR MABLEY, of Henrietta Street, Covent Garden, Mechanical Draftsman, for improvements in machinery or apparatus for making nails.—Sealed May 23, 1842.—(*Six months.*)

BENJAMIN COOK, Junior, of Birmingham, Brass-Founder, for improvements in the construction of bedsteads, both in metal and wood.—Sealed May 23, 1842.—(*Six months.*)

FREDERICK GOOS, of Manchester, Jacquard Machine

Maker, for certain improvements in the jacquard machine or apparatus to be used or employed in looms for weaving.—Sealed May 23, 1842.—(*Six months.*)

SIR JAMES MURRAY, of Merrion Square, Dublin, Doctor of Medicine, for an improved method of combining various materials, in a manner not hitherto in use, for the purpose of manure.—Sealed May 23, 1842.—(*Six months.*)

WILLIAM GEEVES, of Old Cavendish Street, Gentleman, for improvements in machinery for cutting cork.—Sealed May 24, 1842.—(*Six months.*)

JAMES STEWART, of Osnaburgh Street, Regent's Park, Piano-Forte Maker, for improvements in hinges for pianofortes, and other purposes.—Sealed May 24, 1842.—(*Six months.*)

THOMAS WATERHOUSE, of Edgely, Chester, Manufacturer, for a certain improvement or improvements in machinery for carding cotton, wool, flax, silk, and similar fibrous materials.—Sealed May 24, 1842.—(*Six months.*)

JOSEPH DUCE, of Wolverhampton, Lock Manufacturer, for an improved lock, and key to be used therewith, and an improved slide-bolt for the said lock, applicable to other purposes.—Sealed May 24, 1842.—(*Six months.*)

JAMES BOYDELL, Junior, of the Hope Farm Works, Stafford, Iron Master, for improvements in the manufacture of keel-plates for vessels, iron gates, gate-posts, fencings, and gratings.—Sealed May 24, 1842.—(*Six months.*)

JAMES POTTER, of Manchester, Manufacturer, for certain improvements in machinery for spinning cotton, flax, and other fibrous substances.—Sealed May 24, 1842.—(*Six months.*)

PETER KAGENBUSCH, of Whitby, York, for an improvement in the dyeing of wool, woollen cloths, cotton, silks, and other fabrics and materials.—Sealed May 24, 1842.—(*Six months.*)

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